The
MINING
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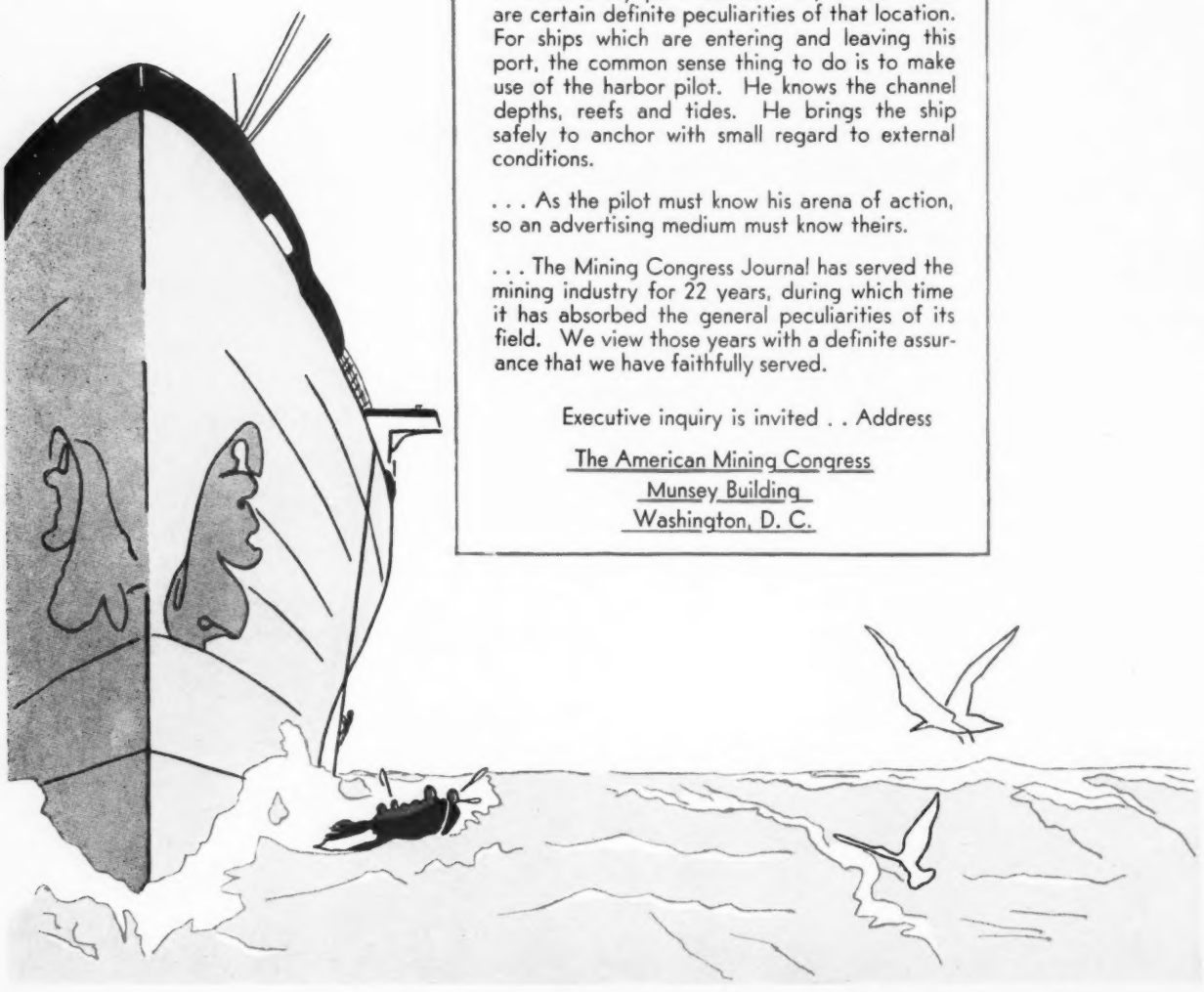
JUNE
1936

the common sense thing to do



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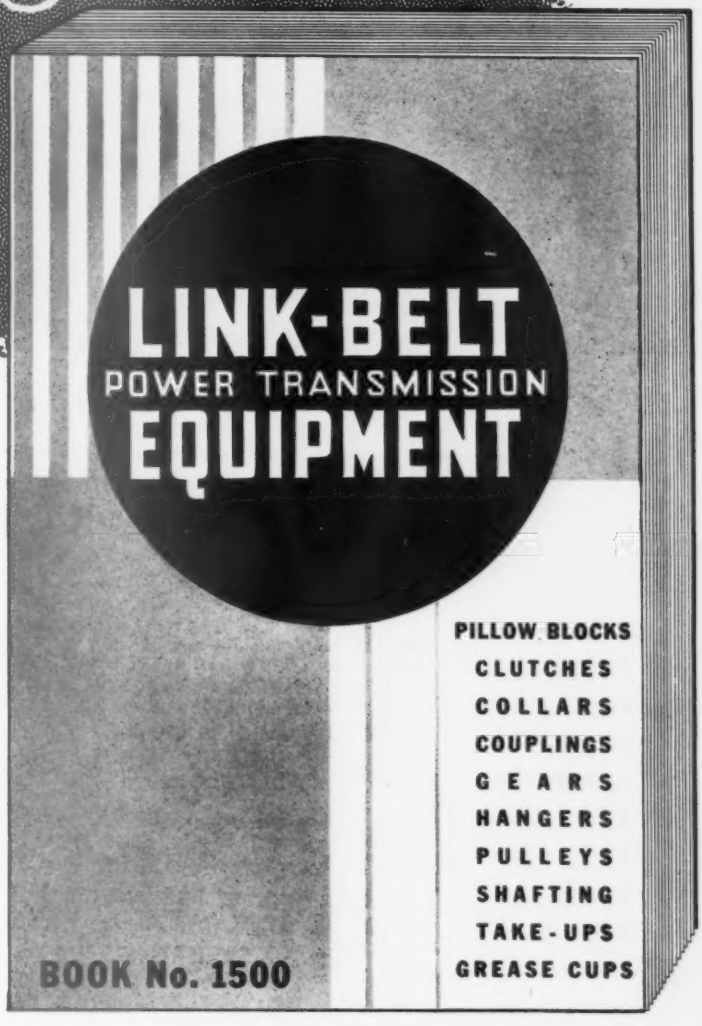

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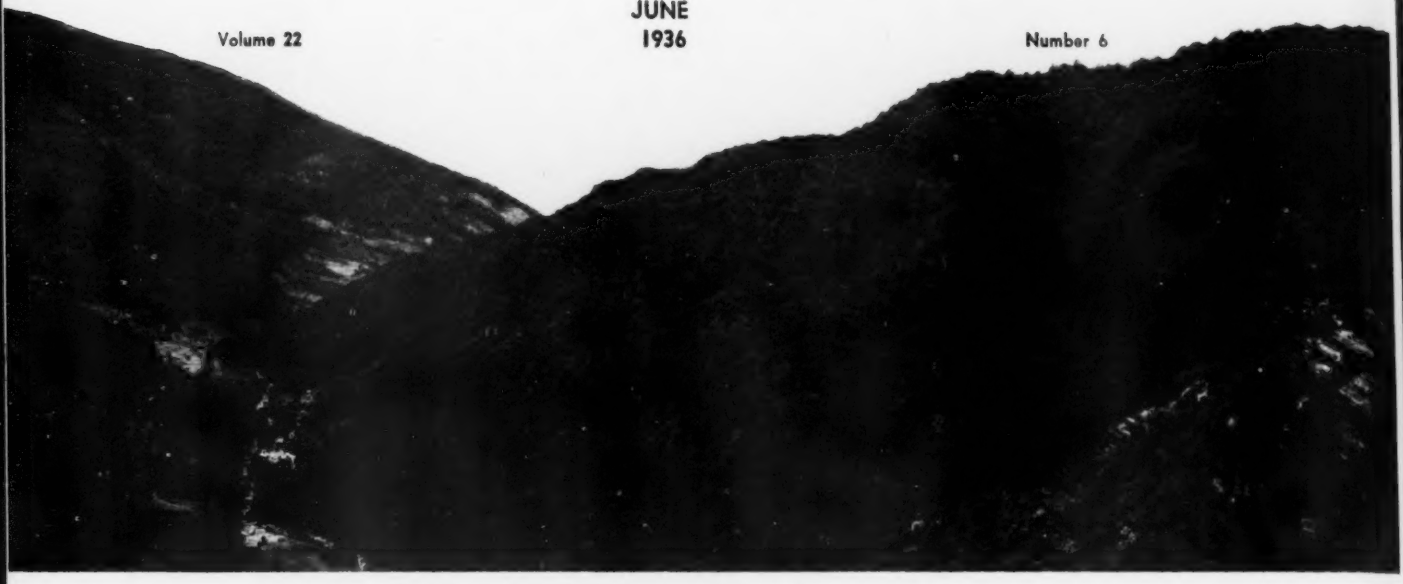

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JULY
Issue

MANUFACTURERS'
NUMBER

Published each year in July —Emphasizing importance of modern equipment in efficiency and cost reduction.

JULY
Issue

MANUFACTURERS'
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All articles presented by manufacturers of mining machinery and supplies. Don't fail to read this important number.

Published monthly by The American Mining Congress, JULIAN D. CONOVER Secretary, Publisher, Munsey Bldg., Washington, D. C. Copyright, 1936, by The American Mining Congress. Entered as Second Class Mail Matter January 30, 1915, at the Post Office at Washington, D. C. Yearly subscription, United States and Canada, $3.00; Foreign, $4.00; Single Copies, $0.30.

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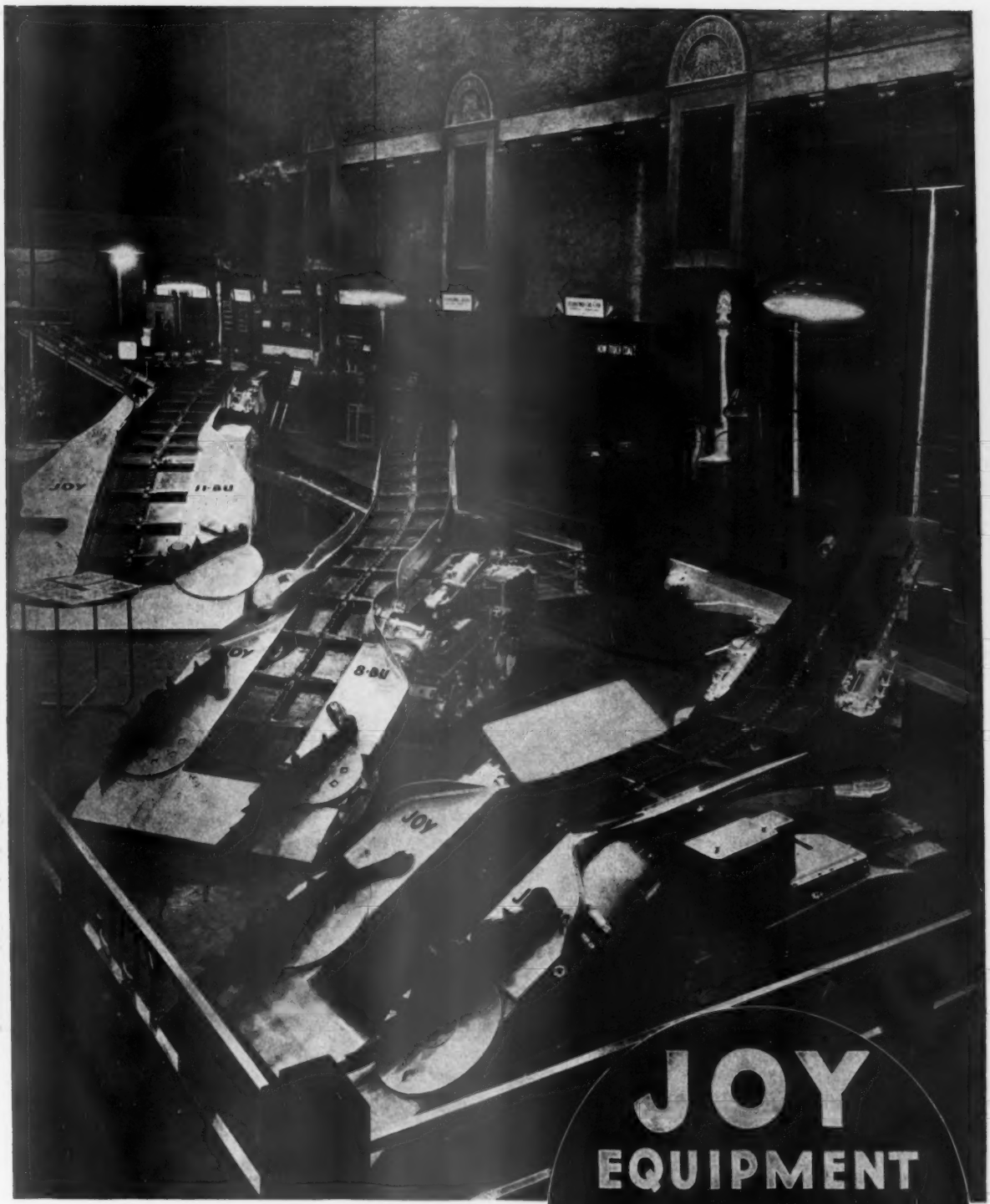

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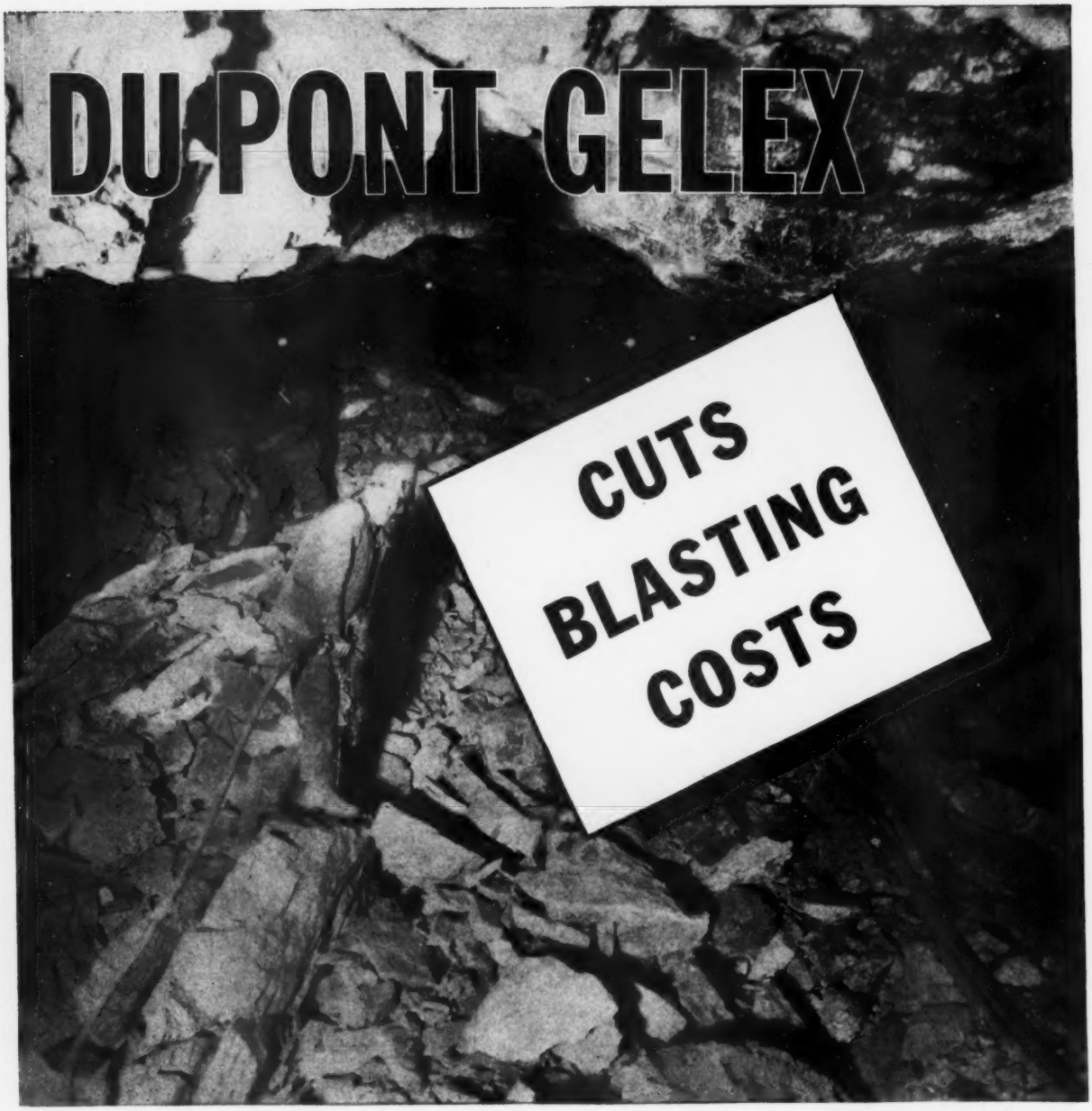

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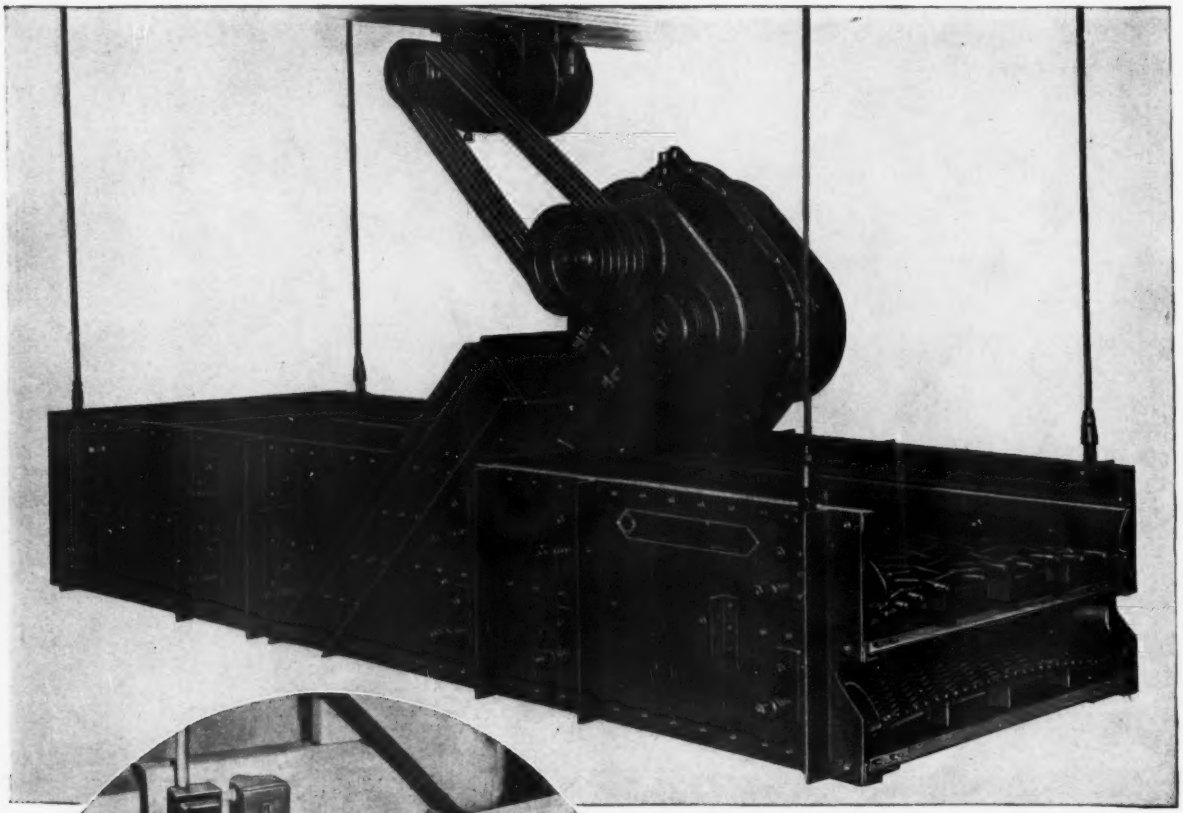

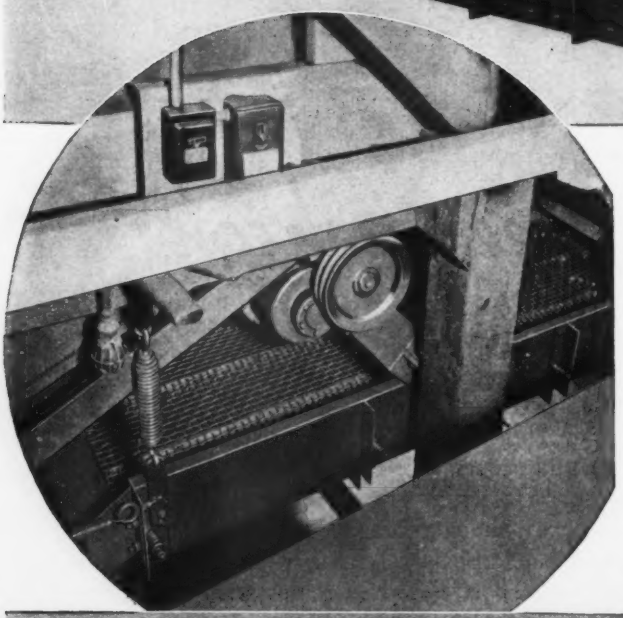

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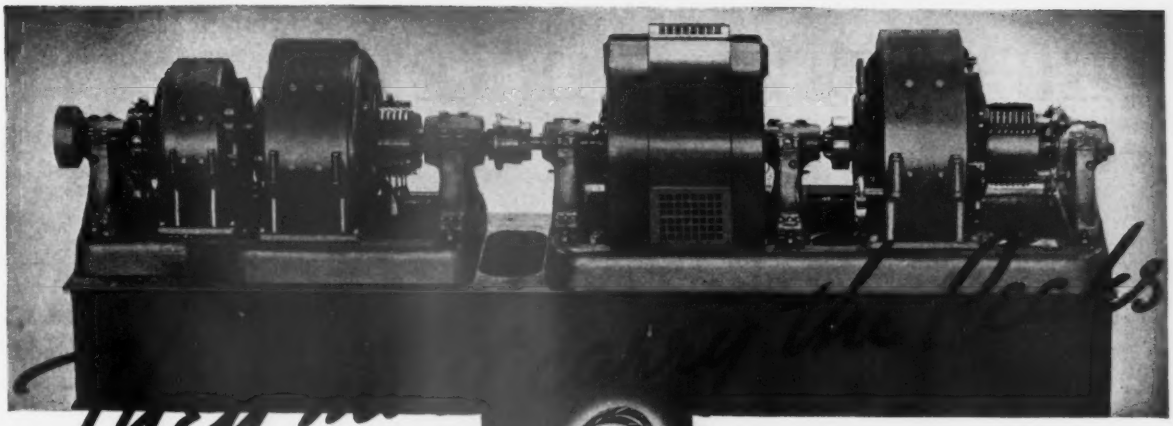

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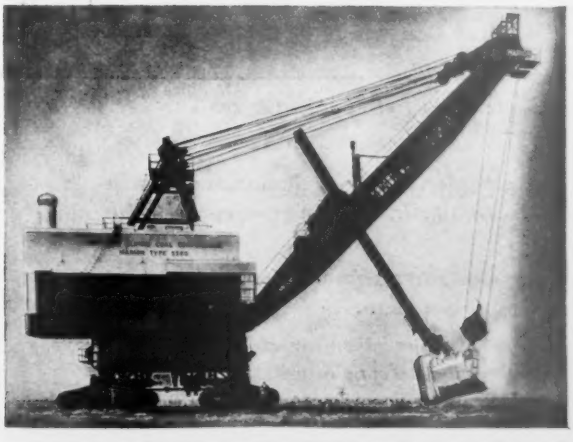

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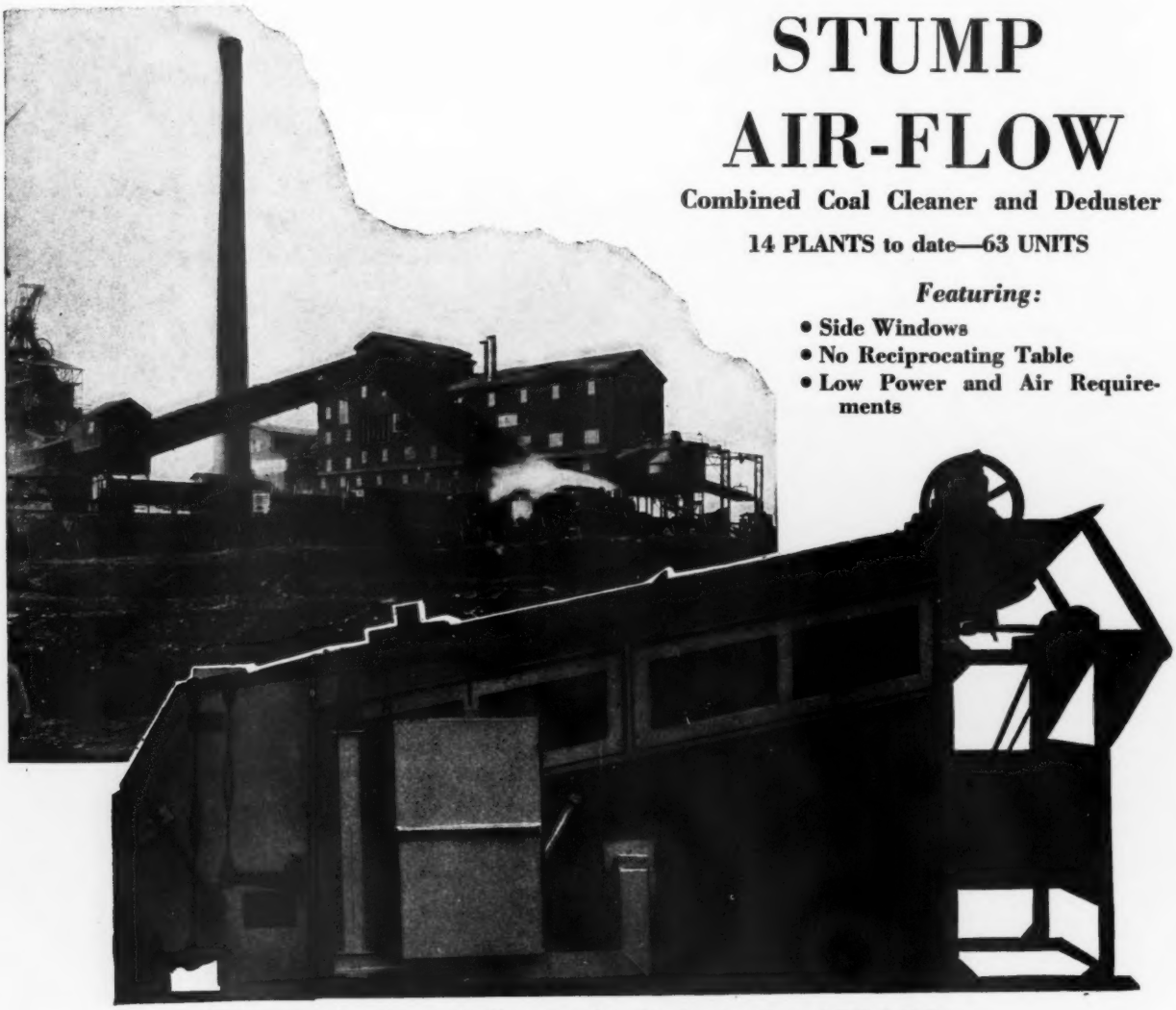

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LABOR and CAPITAL

THE great contest between labor and capital, which has been almost continuous throughout world history, has been because of a belief that capital was receiving more than its just share of the combined earnings of labor and capital.

Notwithstanding the colossal fortunes which have been accumulated, indications are that labor has had its share of the proceeds.

All capital is but stored-up labor. The earnings of capital, theoretically at least, are always cumulative, while the greater part of the earnings of labor are continuously consumed.

The moment the wage earner begins to deposit his surplus earnings in a savings account he becomes a capitalist. The moment he makes an investment in a home or any other property he becomes a capitalist. Capital accumulates while wages are either immediately consumed or are invested, thus assuming a place as a part of stored-up capital.

It must be recognized that all wages must come either from the earnings of industry or from stored-up capital. When taken from stored-up capital, business is unprofitable and losses force a discontinuance of operations and a discontinuance of employment.

Wages in excess of the earnings of industry can only be continued until the capital involved in the enterprise is exhausted. Sooner or later wages and proper capital charges in excess of the earnings of industry will wreck the enterprise, the certain result of which is business depression and unemployment.

The American Federation of Labor is urging a further increase in wages and further shortening of hours of employment. If the writer's information is even approximately correct, this movement is fraught with danger to labor.

Labor is entitled to its share of the earnings of the industry in which it is employed.

Indications are that up to this time the burden of increased wages and shorter hours, has been as great as industry can carry and that capital investments have been retarded. The number of unemployed has not been decreased as rapidly as desired. New enterprises must be relied upon to absorb this excess labor.

At this time there is a gradual increase of employment.

This is made possible, not by a lowering of the face value of the wages paid, but by an increase in price of the necessities of life.

Wages remain normal but the purchasing power of such wage is being decreased by the beginnings of an inflation which will, in the near future, manifest itself with growing intensity. The product of labor will command a higher price and thus make profitable the services purchased at a high price.

The distribution of vast sums of money for relief is beginning to be felt and the early distribution of bonus payments cannot but create a largely increased demand for merchandise.

These conditions, and the more important psychology of growing public confidence, are certain to justify high wages which is but another expression for profitable business. Business cannot move without the employment of labor. The downward spiral of the gloomy days is being replaced, all too slowly, by an upward tendency.

The contest between labor and capital will always be with us. We shall never be able to define with accuracy how the profit from business activity shall be divided between labor and capital, but we can always know that labor's part cannot exceed the net earnings of capital and labor combined except by the destruction of the capital structure without which there can be no employment.

The Mining Congress Journal

Volume 22 JUNE, 1936 Number 6

E. R. COOMBES, Editor

A Journal for the entire mining industry published by The American Mining Congress

Who Pays the Borrowed Money?

EVERYONE KNOWS that it costs a great deal to run the Government, even in ordinary times. And while the present high cost of operation has caused considerable comment, few people take any particular interest in just how the funds are obtained. For a good many years Uncle Sam has been looked upon all too frequently as a national Santa Claus. Yet it is a fact that two-thirds of the taxes that the Government collects are passed on to the public in higher prices for food, clothing, rent, and those things which go into every-day living. It has been reliably stated that out of the family purse hidden taxes take 20 percent of every dollar spent.

The average taxpayer's contribution to Government upkeep, while small, in the aggregate is a vast sum. Government borrowing is merely postponed taxation. The American Factfinders Institute recently said "if Government borrowing stopped today with the $50,000,000,000 public debt, there would be a burden of future taxes equal to $1,000 on each of the 50,000,000 'employable' persons."

Extension of Government activities can be paid for only by assessing the taxpayer. In all of the proposals for greater and still greater Government expenditures it will be well to keep in mind that some day "father will get the bill," and when this happens the storm of protest will assume significant proportions.

Future Frontiers

IT HAS frequently been said, particularly during the days of our industrial depression, that all our frontiers are conquered; that we have done everything—seen everything—been every place; and that there is no future comparable to the past for young America.

Nothing is further from the truth. It is true that the earth's surface has been fairly well explored, and that there are few new countries to exploit. We are, however, entering a new era, and the opportunities offered future generations surpass those of previous generations.

New industries and new products are our frontiers. The fact that machines have replaced hand labor is merely a beacon in our progress. The only drawback today to our industrial advancement is the tendency to make our citizens dependent. The Henry Fords of tomorrow will not be the boys who have absorbed the doctrine of the world owing them a living; the Thomas Edisons of the future will not be the boys who live on a Government dole; the great industry leaders of the future will, as in the past, be men with independent minds and wills, who have courage and are not in the least afraid of the future.

Risks Taken Despite Warnings

THE TWO of the three men who were trapped in and rescued from the old Moose Gold Mine in Nova Scotia, Canada, during the period April 12-23, are not heroes as some newspapers and persons think; they were foolhardy and are fortunate that only one of them lost his life. In addition to the discomfort and privations they experienced, these men had the Province of Nova Scotia, the Dominion of Canada, the United States, and probably other parts of the world worried about their fate while being dug out by miners who did so at considerable risk during the 10 days. How many more lives will be endangered and lost by ignorant and careless men who enter old workings without first sounding the rock and timbers with a pick or bar and making simple tests for the quality of the air therein by means of a candle or lamp, as advised by state mine inspectors, Bureaus of Mines, and Departments of Mines, the world over? It seems almost as if warnings were useless. Our contemporary, *The Northern Miner,* Toronto, Ontario, for April 23, speaks plainly on this matter.

Lucky Thirteen

WITH THE Thirteenth Annual Coal Convention and Exposition only a pleasant memory, there are two thoughts that are uppermost in the minds of the approximately 4,000 individuals who attended. First, that it was the best convention ever held for the coal industry; and second, that the industry is really headed for bigger and better things.

In the five days' discussion, which centered wholly upon efficient operating practice, there was no note of pessimism. Each speaker gave a progressive paper, and showed that the industry is fully aware of its production problems and equally capable of solving them.

Coal is back in the market in a big way. It is modernizing, installing labor-saving, efficiency-producing equipment, and otherwise preparing to give the consumer a product that will meet all competition.

The convention and exposition were an inspiration. If those who have made the statement that "coal is a dying industry" could have been present they would have quickly changed that phrase to "the coal industry is progressive, wide-awake, and efficient."

MODERN MINING METHODS and Coal's Future†

By P. C. THOMAS *

MORE than a century ago when the first mining of coal launched what was to become a great, essential industry, few realized that the development of the infant nation would require the building and operation of a complex industry that would mine and dispose of more than a half billion tons of coal in one year, operate more than 14,000 producing mines, employ nearly 700,000 men, and carry on the necessary research and experimentation that would bring ever-increasing efficiency.

When my grandfather came to Pennsylvania, from the coal fields of South Wales, he found an anthracite industry that had grown from the production of a mere 1,300 tons in 1821 to 9,800,000 tons in 1861; while its companion, the bituminous industry, had gone from nothing to nearly 7,000,000 tons during the same period. Had he been told that in 57 years, in 1918, production was to average nearly 16,000,000 tons a week, he would have been astonished. And, yet, that is exactly what happened in that year, when the total output of anthracite and bituminous coal was more than 678,000,000 tons.

In those early days the mining of coal was simple. Furnaces for ventilation, mules pulling small wooden cars on wooden rails, coal shot from the solid with black powder, oil lamps, entries driven on a fixed gradient regardless of direction and without the benefit of engineers' lines—these were some of the items of the mining method of those days. The evidence of inexhaustible supplies of coal made its owners careless with their resources; pillars were not removed and places were promptly abandoned if water hampered operations or squeezes threatened. This was the reckless and careful heydey of the coal industry.

But the fast-growing infant, industrial America, was hungry for coal; and, its demands became greater and more urgent annually. Production grew by leaps and bounds, new mines were opened first by scores and then by hundreds. The mines became larger and deeper; haulage distances underground became longer and mules and horses became impractical; more adequate ventilation than natural draft or that induced by furnaces became an urgent need; and the industry pushed ahead seeking new methods and better machinery. Old haphazard methods gave way to modern engineering skill and efficient mine management; and steam, compressed air, electricity, locomotives, cutting machines and permissible explosives were brought into use to aid the upbuilding of production.

Under the stimulus of ever-increasing demand, the coal industry built up a gigantic establishment capable of producing at least 900,000,000 tons of coal in a year.

At about the turn of the century, consumers of coal directed their attention to the more efficient application of coal, and the so-called fuel economy began. The first inspiration of the movement in this direction doubtless came from the tremendous total amounts of money spent for coal, even though the prices that prevailed made coal a low-cost fuel. Increasing labor costs following the unionization of a large part of the industry carried prices higher; and increased freight rates carried the cost of transportation to such levels that the delivered cost of coal reached the point where consumers were induced to seek other fuels and to work for more economy in combustion practices. Finally, the Great War brought a demand for coal that carried prices to previously unheard of levels and the movement of fuel economy and substitution of other sources of energy were greatly accelerated.

The railroads (largest consumer class), electric public utilities, general manufacturing plants and domestic consumers all turned their attention to reduction in fuel bills. They did this to such good advantage that the following annual savings of coal tonnage now result from fuel economy alone:

Class of Consumer	Percentage Reduction in Coal Used Per Unit of Performance
Steam Railroads:	
Freight service	28.8
Passenger service	17.8
Electric public utility power plants	53.1
Blast furnaces	19.6
Coke manufacture	19.2

In 1933, the loss of tonnage to the bituminous coal industry through these economies alone was no less than 70,000,000 tons. Improvements to condensers, turbines, the use of pre-heated feedwater and changes in boilers permitting the use of powdered and colloidal fuel and the installation of various types of mechanical stokers were among the items responsible for these economies. The change from the beehive to by-product method of making coke saved millions of tons of coal a year.

Meanwhile, the very rapid development of the internal combustion engine and its application to automobiles caused such a demand for gasoline that the oil industry and its associate natural gas were expanded tremendously to meet the demand. The result of this was continually increasing quantities of fuel oil that had to be sold, given away or thrown away. This creation of very large quantities of a cheap fuel oil led to numerous installations of oil burners in industrial and utility plants and the home.

Absence of price restrictions on the output of an almost laborless industry,

* Vice president, Koppers Coal Company.

† Presented to Coal Convention, American Mining Congress, Cincinnati, Ohio, May 14, 1936.

the product of which was able to reach consuming centers at a minimum cost, enabled its producers to fix prices always just below the prices of competing coals, which could go no lower in price because of high, fixed wages and freight rates. The success of petroleum in replacing coal as a source of energy is indicated by figures of the United States Bureau of Mines that show that in 1913 coal produced 91 percent of all the energy obtained from coal and petroleum and its products; whereas, the percentage contributed in 1933, was only 65 percent. Thus, in just 20 years, petroleum increased its share from 9 to 35 percent of the total energy obtained from solid and liquid mineral fuels.

Thus, an important item in the dilemma of the coal industry, with its high and fixed labor and transportation costs, is that of having a maximum price fixed by a competing industry that suffers not at all from large labor and transportation costs.

Meeting such competition means the cutting of costs or margins of profit (or both) all the way from the retail coal dealer back to the mines. And yet, the return to the producer must be sufficient to pay his cost, or he will go broke. This method of holding trade against oil competition has been tried by producers and many of them have gone broke, others are in the process now, and still others will follow the same course, if some remedy of this economic evil is not found.

One method of placing the competition of oil and coal on an appropriate and ethical basis is a coordination and control of the prices of both. It is not my purpose to discuss the principle of price regulation, but it does seem appropriate to remark that such a nation as the United Kingdom has found it both necessary and practical to protect its coal industry from a similar type of competition.

Congress has tried the experiment of controlling and regulating the prices of coal without a similar regulation in the oil industry—and it failed.

The principal results of that experiment were the establishment of higher prices than had prevailed, thus giving oil the chance to raise its prices and still undersell coal; and the establishment of wage scales beyond the level of economic reason. These two factors plus added assessments in the form of "emergency" freight charges for the benefit of railroads already getting more for hauling coal than the producers receive for it have left an extremely narrow margin for the producers. And they find themselves in the extremely uncomfortable position where they must mine and market their product within that narrow range—or go out of business.

The American people ever have been resourceful; and, in the past, they have been able to rise and meet difficult situations. But, in earlier days, there were frontiers where added demand was constantly springing up and new industries were being born to add their demand for fuel and other commodities. The railroad, telephone, automobile, steamship and radio have all played their part. Is some great invention now in the making that will bolster up a declining industry and take care of the unemployment that accompanies its decline? Or has our nation reached its full growth, and, having no frontiers left (either geographical or industrial), must we turn now to governmental social security, unemployment insurance, and old age pensions plans, as the final reward for a lifetime of work?

I have gone to considerable length to develop the situation of this industry which from a very small start 100 years ago reached an annual output of more than 600,000,000 tons, valued at more than $1,300,000,000, only to be swept backward a quarter of a century, the demand for its product reduced to a bare 400,000,000 tons that returned to the industry less than $900,000,000.

What is the industry doing to help itself?

The practical mining man in his endeavor to change losses into profits turned his attention, naturally enough, to the matter of production costs. And he found, upon analysis of his cost sheets that many important items—material, power, taxes, royalties, depletion, etc., were fixed and completely beyond his control. The cost of transporting his product to market was controlled by an unsympathetic group of railroads, apparently not awake to the seriousness of their own situation, or at least incapable of realizing that the way to help themselves was to help the coal industry retain its volume of business. Their chief and constant endeavor has been to extract a nickel, a dime or fifteen cents a ton more from coal, regardless of the ultimate penalty to be paid. Labor costs at times have been too rigid and at other times so flexible that they offered fine opportunity to the price-cutter to buy business at the expense of labor.

So, hemmed in as it was—and is—by a series of inflexible barriers, the industry has found but one avenue that may offer escape from its predicament; i.e., labor saving, or, in other words, the extraction of the same or larger quantities of coal with fewer men.

The period of shrinking prices that followed the World War, accompanied as it was by maintenance of high wage rates in some producing areas and a return to lower rates in others, witnessed a marked advance in the use of the mechanical loader. Widespread attention was given these machines for the first time in 1923; and it was then the thought of many that it promised greater results in the cutting of costs than the power shovel in strip mining and the cutting machine in underground mining. An inquiry by the United States Geological Survey indicated that in 1923 a total of approximately 2,000,000 tons was handled by 105 mechanical loaders in 52 mines. According to the same source of information, no less than 3,428 machines of all description were in use in 1931 and they handled 47,562,000 tons, or 12.5 percent of the total output of bituminous coal in that year. After that year the progress of mechanical loading was hampered by a period of low wages, chiseling and unparalleled cut-throat competition.

With the advent of the National Recovery Act in October, 1933, the situation was completely changed; and a return to high wages, a 7-hour day and 35-hour week made imperative a further change of old mining methods. At the present time changes are progressing rapidly in the following directions:—concentration of production to smaller areas; the use of larger cars and locomotives and improved cutting machines; the installation of larger and more efficient screening plants and washers; new and more standardized sizing; the dedusting of firm structure fine coals; and the treatment of coal to improve combustion and allay dust. These changes, together with mechanical loading, have decreased costs in some instances and have increased them in others; but all of them have improved the competitive position of coal. Of all these improvements, the change to mechanical loading promises more in the way of obtaining more coal with less men and, thereby, effecting large savings in production cost. The time is not far distant when the hand loader will be as rare as is the pick miner.

I can sense your thought that labor as a group may regulate the increased use of machines. This, I think will not be true for any length of time. There was a great furore and strike when cutting machines were introduced and heavy losses were suffered by both the producers and miners. But progress and increased efficiency could not be held back permanently, and those machines made apparent their value to the miners. And so it will be in the case of these newer machines.

Mine labor is coming to recognize the fact that their future depends entirely on the ability of coal to meet the ever-increasing competition with cheap oil, gas and water-power; that they (labor) have an important part to play in the struggle; and that every efficiency and economy must be practiced. They have no evidence that the Congress will come to their aid; and they must realize that they must help the producers carry on the battle until the economic laws against waste compel a stop in the waste of oil and gas. This, in view of lack of discoveries of new large deposits of these fuels, I think will happen within five years.

In the meantime the coal industry needs only to continue steadfastly along the sound lines now being followed and it will again reach the high place in the American industrial structure that is its right.

COAL PRODUCTION METHODS--

Today and Tomorrow†

By PAUL WEIR *

IMPROVEMENTS in coal production methods are being made at an ever accelerating rate. At times, it seems difficult to keep abreast of developments. What has seemed impossible of achievement only yesterday is being done today.

For many years and up until the past decade or two, the chief problem of mining men was considered to be proper mining methods. This involved a choice between room and pillar, and longwall or modification thereof. When mining men met, discussions centered largely on this question of mining methods. Text books on mining devoted many pages to it and only a meager amount to other problems of production. Today, while not detracting in any way from the importance of proper mining methods, we are concerned more and more with production methods, of which mining methods is but one division. Other important divisions of production methods which today receive just as much attention as mining methods are transportation, safety, face preparation, face loading and surface preparation. In a broad way, production methods have to do with the methods of performing all of those individual operations, surface and sub-surface, directly and indirectly connected with the extraction of coal from the earth's crust and its preparation for the market. Likewise, broadly speaking, the term "methods" includes not only practices but also the equipment employed in these practices. It is safe to say that when considered from this viewpoint, the problems of coal production closely resemble those of production in a factory. In fact, they are more complicated than those of a factory because of those additional problems which are peculiar to underground mining.

As previously stated, production methods may be broken down into divisions. Each division has at least two problems in common with every other division. These are organization and equipment. Some generalizations on these two things may be made.

The manufacturers of mining equipment after years of expenditure of money and effort have developed and are offering to coal operators today, mechanical and electrical devices which in the hands of a skilled operator can perform practically every task in the production of coal. The result of this is that comparatively few common laborers are required in and around mines. What is required are operators of machines. Practically all of the equipment being offered by manufacturers has passed the experimental stage, and is being used successfully at some mine or mines. This equipment may not be perfect but at the same time it is not experimental. Its application in any specific mine may be experimental. Sufficient data and experience are available so that even the application of equipment need not be entirely experimental.

Organization of the working forces at a completely modern mine must be patterned after the organization in mass production industries. Workmen must be trained to become expert on a single task if the maximum in safety and efficiency is to be had. He can not be expected to be a jack of all trades. Coal operators can study factory management with profit to themselves if they desire to get the most out of any investment in modern machinery.

Above all, production methods of today and tomorrow call for the intelligent assembly of facts by engineers, the analysis of those facts and then a decision based on those facts and not on tradition. We must know the "whys" and "wherefores." Mining engineering has become to a large extent industrial engineering. The machine age in coal production is here. The nation-wide stabilization of wage scales and hours of employment has removed the opportunity to cover up lack of efficiency and intelligent management by wage cuts. The manufacturers of equipment are on their toes and have given coal operators the necessary mechanical and electrical equipment. The operator's problem is the intelligent selection and application of that equipment. Within a very few years, less than five in my opinion, mechanically loaded and cleaned coal will dominate the market.

Scientific research is finding its place in production. Complete and detailed knowledge of the coal in our particular mine or mines is necessary not only in mining but also in surface preparation. A specific instance will illustrate this point. All coal seams are made up of the banded ingredients, vitrain, clarain, durain and fusain. The physical and chemical properties of these ingredients differ greatly one from the other. Some break down more easily than others. For that reason, the nut size may have percentages of these ingredients which are different from the buckwheat size or from minus 48 mesh dust. The amount of ash and its fusion temperature change with any variation in the percentages of these ingredients. Today our preparation plants are turning out a relatively clean product. Tomorrow this clean coal will be separated into its banded ingredients by crushing, sizing and further washing. The results of this will be to produce grades of coal having physical and chemical characteristics far different from clean mine run. Research is becoming a division of production.

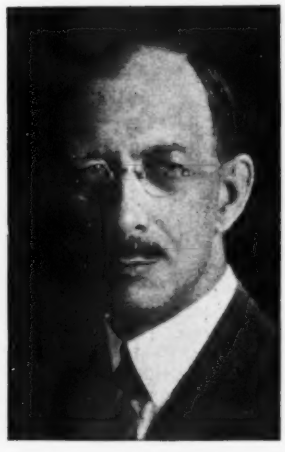
The coal industry is going through revolutionary changes. It is no longer backward. On the contrary, it is now becoming one of the most modern and progressive. With or without political regulation, it will forge on. Those in the industry who are "learned out" and can not assimilate the new things will pass out of the picture. Those in the industry who have vision will be rewarded. Recently Mr. Sargent, president of the Chicago and Northwestern Railroad, made an addition to the old adage "necessity is the mother of invention" by saying "competition is the father of progress." Because of, and in spite of competition, coal marches on.

* Vice president, Bell and Zoller Coal and Mining Company.

† Presented to Coal Convention, American Mining Congress, Cincinnati, Ohio, May 11, 1936.

PROGRESS IN RELATED FIELDS OF INDUSTRY†

By L. E. YOUNG *



ONE of the business magazines which many of you read contains a section headed "No Business Can Escape Change." Annually some of the great machinery companies review the progress and achievements in their field and we thrill at the progress they are making. The coal mining industry and every other industry is undergoing technical change, and these changes indicate growth, improvement, and progress. Let us forget for a few days the economic problems that beset us in the coal industry and get as much encouragement as we can by observing the progress that is evident in the industrial world as a whole.

The pamphlet of the American Mining Congress announcing "A Few of the New Things to be Shown at the Exposition" lists nearly 100 items. It is interesting to note that a number of these new things are brought to us from other industries; that is as it should be. Here at Cincinnati it is possible in a few hours, to have the best new things paraded before us—like models in a "Fashion Show." Moreover we have the opportunity to go to the manufacturer of these new things, learn who is using them, and, by personal interviews with other operators whom we actually know, verify the results they have secured with these new devices.

In discussing with our own staff the fields in which substantial progress can be made, we have pointed out that we must not overlook research in other industries, and the developments that are being made outside of coal mining. It has been our endeavor to have our men visit plants in other industries, to keep in touch with the technical literature in related industries, and to profit by the experience of men working in all industrial fields. Our research should take advantage of research in every industry, and the innovations in other fields that can be adapted should find a place promptly in our routine.

Coal mining may be considered from a number of viewpoints; one is that it is a materials-handling job, similar in many respects to other materials-handling jobs. From that point of view coal mine operation is handling coal, rock, water, air, and supplies as cheaply as possible. Whether we use explosives, drills, hand shovels, power shovels, conveyors, rails, pipe, rope, cable, cars, wheels, axles, bearings, lubricants, locomotives, hoists, pumps, building materials, air compressors, dynamos, motors, transformers, batteries, electric lamps, boilers, engines, fans, tools, tool steel, we can learn something from men and corporations in other industries who are using such tools, equipment, and materials. We must take advantage of all the experience they have had and we should search the industrial fields over to find the best tools, materials, equipment, and methods.

The automotive industry will teach us much about bearings and lubrication, the machine tool industry can give some help in steels for coal cutting, and the aeroplane research engineers have told us the secrets of air movement in their wind tunnels. The steel industry can point the way in multiple-shifting of plants and equipment. The railroads are applying light alloys in transportation. The use of welding is being extended in many fields at a rapid rate. From the electric power industry we can learn much on control of operations generally. An enumeration of all the new things attributable to the mechanical, electrical, and chemical industries would not be possible in the brief time available, but a serious survey of the exhibits, and attendance at the various meetings will, I am sure, prove that the foregoing statements are not exaggerations.

Most of the advances and the technical progress referred to may be brought to the eye by tangible exhibits, but many changes and improvements are being made which cannot be shown in an exposition. I refer to progress in research, management, and human relations. Other industries are stressing these subjects and they will receive some attention in the programs that are being presented. Your participation in the discussion will be helpful to others, and I am sure the respective chairmen will appreciate any contribution you may make on papers relating to the subjects just mentioned.

In this gathering of Practical Operating Men I wish to take the liberty of repeating something I said on mining research in an address in Pittsburgh six years ago. I feel more strongly than ever that in these days when we are talking so much about "New" things, we need to secure all the help we can get from the men in our own organizations—the rank and file—the men at the face. I believe "there is great need for more research of the type referred to as 'field studies' and 'field experiments.' Such research should be conducted by the mining companies themselves, under their own auspices, with their own officials and men. Many of the problems worth investigating require observations covering a long period of time. To secure the most reliable results there must be available, cost data which represent not simply a set-up for a test, but they must cover a period of production on a practical operating basis. There are few tests made underground that exceed in value those made by the regular mine crew who are interested in the problem before them. The coal mining industry needs more research done with the aid of the practical operating men on the job who should be given an opportunity, because of their ability and loyalty, to apply their knowledge in the study of the more or less involved problems at the working face.

"One of the greatest needs in the mining research field is the development of 'research mindedness' in more of the operating officials of the mine. It is not unnatural that mine bosses should be more or less aloof when new methods and new equipment are tried without consideration for their experience and judgment. Suggestions coming from the veterans at the face will frequently

(*Concluded on page* 57)

* Vice president, Pittsburgh Coal Company.

† Presented to Coal Convention, American Mining Congress, Cincinnati, Ohio, May 13, 1936.

OUR MODERN COAL INDUSTRY†

By CHAS. F. HAMILTON *

IT IS my thought that the Program Committee in the selection of the subject of my brief talk had in mind the pointing out of certain changes in the coal industry which would work for its betterment and advantage. Possibly because of the complexion of the committee they were hesitant in using the words "New Deal" in connection with the subject.

Many men in the industry, at gatherings of this kind, express ideas which would undoubtedly place our industry in a class by itself as to the desirability of being connected with it, but one of the great difficulties has been and is the ability to formulate a set of rules to which all operators will subscribe and then enthusiastically and wholeheartedly put into effect.

A year or so ago I attended a meeting of the coal operators of an adjoining state where one of the older operators made a very interesting half-hour talk as to the ills of the industry and what should be done to correct them, and after the meeting I narrated the purport of his talk to a legal friend of mine, with the final remark that the difficulty in carrying out the speaker's suggestions would be the adequate policing of them. He replied that he knew a way of doing this, and when I asked the method, he said, "arrest them all." Perhaps that is the germ from which has sprung the present plant of Federal assistance. May I, however, for a brief few minutes ask your attention to two points which seem to me would be of value to our industry.

The first is better sportsmanship. You may say at once that this is only another term for cooperation, but I sincerely believe that the willingness to play the game in accordance with a reasonable set of rules and regulations would go far toward producing the results which we all are so earnestly striving to accomplish. In any sport the individual is naturally the unit, but in baseball, football, hockey, and many other games it is the assistance which one individual gives to another which makes championship teams. In fact, there are many instances where teams composed of individual stars are soundly beaten by a team where the members are ready to make some personal sacrifice for another member in order that the team play may reach the highest point of efficiency.

It has been said of the coal industry that they are not good sports because of a willingness to cooperate only to the extent of lack of expense or effort to the individual. In other words, many operators do not view questions of policy from the point of what is best for the industry as a whole, but entirely from the effect that it may have upon their particular operation. It always takes real courage to be a good loser, but not a great deal of fortitude to smile when you are winning. Would it not be good sportsmanship if in the event one of your salesmen called on a prospective customer to find that you did not have the proper quality of coal for his use to advise a competitor of the situation in order to prevent the business from going to some other type of fuel.

Quite naturally you may say, what shall these rules be, and who shall be the umpire. These are, of course, necessary adjuncts to the idea, but time will not permit of their discussion.

My second thought is one of greater initiative. Our product is different than many other products used today in that it is almost impossible to create an additional market. We all look upon coal as being the source of energy for heat, and quite possibly are not giving the attention towards the investigation and discovery of new uses for it. Then, too, it seems as if the relationship between the producer and ultimate consumer of our product is not as close as it should be. There are too many middle men between the man who mines the coal and the man who really consumes it, and in reality these are the two parties who are most vitally interested in the complete transaction.

Of course, lower costs of production, high realization, lowering of freight rates and uniform rates of wage must all have their places in the problem, but it is my belief that some time should be found for improving the sportsmanship and increasing the initiative displayed in the industry.

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* Vice president, Binkley Coal Company.

† Presented to Coal Convention, American Mining Congress, Cincinnati, Ohio, May 11, 1936.

• THE ILLINOIS MINING INSTITUTE will hold its summer meeting and eighteenth annual boat trip June 5, 6, and 7. The steamer will leave St. Louis on Friday, June 5, at 10.30 p. m. An outstanding program has been developed, as follows:

SATURDAY, JUNE 6, 1936
10 A. M.

Address of welcome by President T. J. Thomas.

Paper, "Effect of Good Safety Practice on Operating Efficiency," by Eugene W. Fultz, Franklin County Coal Corp.
Paper, "Improving the Car Change Cycle Behind Loading Machines," by Howard Lewis, Old Ben Coal Corp.

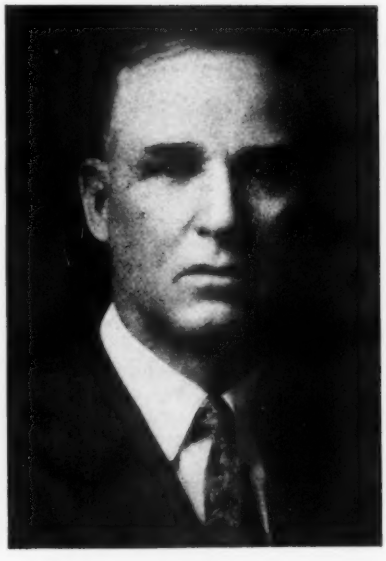
2 P. M.—*Afternoon Session*

Papers, "Factors Affecting Sizes of Coal Produced—Methods of Control:" (a) "Natural Hardness Inherent in the Coal," by Prof. C. M. Smith, University of Illinois; (b) "Cutting and Shearing," by L. A. Hill, Chicago, Wilmington & Franklin Coal Co.; (c) "Drilling and Shooting," by Joseph Lenzini, Bell & Zoller Coal & Mining Co.; (d) "Loading," by J. W. Starks, Peabody Coal Co.; (e) "Screening and Tipple Handling," by Louis von Perbandt, Allen & Garcia Co.

Discussions will be in order immediately after each paper is presented.

MODERN PRODUCTION METHODS and the Future of Coal†

By EUGENE McAULIFFE *



WITH respect to coal production methods, it is safe to say that changes approaching the revolutionary have taken place in the past quarter of a century. Among the most conspicuous of these changes might be mentioned:

The increased percentage of coal undercut by mining machines.

The rapid extension of power-driven coal loading machines replacing hand shoveling.

The substitution of electric cap lamps for oil and acetylene lamps.

The almost general use of permissible explosives.

Marked improvement in all mine equipment and coal preparation methods.

Sweeping reductions in the number of major mine accidents suffered, as well as individual fatal and non-fatal accidents.

Conspicuous improvement in labor relations and the very general elimination of unduly depressed rates of pay, creating a more uniform competitive condition between competing fields.

A better balanced relation between capital invested in mines and annual output.

The items mentioned represent returns received from the cooperative effort of the coal operators, the manufacturers of equipment, the United States Bureau of Mines, and mine labor. Two major opportunities for further improvement remain to be explored.

The experience gained through the attempt to control labor relations, price regulation, etc., through, first, the medium of the NRA Code, and later the Guffey Act, have not proven satisfactory. This premise is well established by the fact that at no time has the industry as a whole been able to agree either on the necessity for, or the workability of any Federal enactment, constitutional or otherwise, to regulate by mandate an industry so widespread and presenting so many diverse angles as does coal. I commend governmental fact-finding, complete and made public promptly, as the most promising aid to cooperative effort.

That the application of labor organization relations has been expanded to the advantage of industry is acknowledged by the majority of coal operators. However, there yet remains ample opportunity for a better recognition of the necessity for continuous cooperation along legislative lines, as well as in matters relating to the more economical and efficient operation of the properties. The further safety of mine employes also remains a fertile field for betterment. The labor organizations should try to compose their internal differences, discontinue their caustic, irritating type of publicity, and give more consideration to matters of mutual interest to employer and employe.

The coal industry is coming back slowly, but "quick money," obtained in the past by artificially created strikes, over-emphasized transportation shortages and "selling out," are things of the past. We need a wider conception of human relationships in dealing with our employes, our customers, and each other. We need rescuing from politically minded bureaus and individuals. In talking to one of my associates a few days ago, and after we had discussed present and anticipated problems, we both agreed that each of our own individual situations could be best met by our "doing our job so well" that even though something cataclysmatic should occur to the nation or the coal industry, we would be asked to stay to assist in the restoration process.

This gathering here today represents a distinct contribution to the better attitude of mind to which I have referred.

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* President, Union Pacific Coal Company.

† Presented to Coal Convention, American Mining Congress, Cincinnati, Ohio, May 11, 1936.

● THE NEW RIVER COMPANY, Mount Hope, W. Va., has awarded a contract for a mine refuse disposal system for their Cranberry mine, to the Interstate Equipment Corporation of New York. The work includes a 100-ton capacity steel storage bin, a 42-in. by 100-ft. steel apron conveyor and a 2,500-ft. automatic, self-dumping aerial tramway.

The system is designed to function automatically. Two 1½-in. diameter lock coil tramway track cables will support a 100-cu.-ft. capacity duralumin car equipped with self-dumping mechanism. The tramway cables will be supported by a 100-ft. high intermediate tower and a 190-ft. pivoted tail tower. A dumping span of 1,600 ft. will provide dump area for 20 years' mine refuse.

This will be the fourth aerial tramway slate disposal system installed at the New River Company's mines by this manufacturer; the other installations are at the Summerlee, Lochgelly, and Sprague mines.

LABOR RELATIONS in the TRI-STATE MINING DISTRICT†

By M. D. HARBAUGH*

THE request of the Mining Congress for a discussion of Labor Relations in the Tri-State Zinc-Lead Mining District at this meeting, presumably arose from the fact that a strike in that district during the past summer completely closed down operations for several weeks and received nation-wide publicity. In view of the fact that in this connection so much misinformation has been broadcast to the country, I have undertaken to prepare a statement on the suggested subject, so that some semblance of the truth might be available to those who are interested in the facts about this district.

History

The history of the zinc-lead mining industry of southwest Missouri, southeast Kansas, and northeast Oklahoma began with discoveries of shallow lead deposits in the vicinity of Joplin and Granby, Mo., between 1848 and 1850.

Zinc mining began in 1871 at Granby. Mining activity was confined to Missouri until 1876 when ore was discovered at Galena, Kans. The first discoveries in Oklahoma were at Peoria in Ottawa County in 1891. In 1904, the Quapaw and Lincolnville fields were discovered, and in 1906 ore was discovered at Hattenville (which later became the town of Commerce), which inaugurated a period of mining and development that culminated in the discovery of the great Picher field in 1915, making Oklahoma the largest producer of the Tri-State area. The Picher field extended northerly into Kansas, and made that state the second largest producer long after the activities at Galena had subsided.

From 1848 to 1934 inclusive, the entire district produced 18¾ million tons of zinc and lead ores, and concentrates valued at 827 million dollars, of which approximately half has come from the Picher field in the 20 years since its discovery.

It is evident that this industry has been a very important factor in the life of a large population in and about the mining district. The state of prosperity of nearly all business enterprises in the region, as well as of agriculture in the surrounding territory, is intimately wrapped up in the mining industry. It is estimated that of some 65,000 people living in the area, at least half are very directly dependent upon this industry, and most of the others are partly or indirectly dependent on it. Needless to say, elsewhere the smelters and manufacturers using the Tri-State products provide thousands of additional persons with livelihood.

Ownership and management of this industry have always been close to the workmen attached to it, for from the very beginning the industry has been made up of many operations, a large proportion of which have been small enterprises of local character. These working people are all intelligent, native white Americans—independent and generally self-reliant. For the most part, they are natives of the Ozark agricultural country along the edge of which the mining district lies, and many of them still live on farms. Nearly all of them have an agricultural background which sets them apart from the typical industrial workers of many localities. No foreigners and no negroes are employed in the industry.

The fact that many of the operators, as well as their managers, superintendents and foremen, have themselves more or less recently been miners, has prevented the development of a breach between employers and employes such as seems to exist in some other industries. At any rate, one cannot fail to be impressed by the democratic attitude that always has existed between management and workmen. There is not a company in the district where the offices of the officials, from the highest to the lowest, are not always open to the most common workman in their employ. Furthermore, it is generally the practice for these officials to make frequent visits through their mines and mills, to stop and talk to the men on the job, and to listen to any man who may care to stop his work to talk to them about a complaint or any other matter. Perhaps the whole system is too simple, direct, and old-fashioned to be understood elsewhere, for it is rather out of line with the modern labor ideas of "class distinction," which require red tape and hired intermediaries to effect contacts between employers and employes, and which presume at the start that the interests of employers and employes are necessarily antagonistic.

A number of times in the history of the field before 1933, national labor organizations made strenuous efforts to unionize the workmen of this mining industry. But all these efforts failed, probably due to the fact that the workmen saw no need for a union to do for them what they could do directly themselves. Furthermore, the operators had always made it clear that the district would remain "open shop," so apparently the men considered that the unions had little to offer them.

Wages

Wages are usually the principal item of contention on which labor organizations sell themselves to the workmen. However, in this industry the unions found little to work on in this connection. By long tradition, wages have been adjusted automatically to the price of zinc concentrates, so that when prices go up, wages go up, and when prices go down, wages go down. And in fairness, it must be said that most operators are slow to lower wages when prices are declining, and are prompt to adjust wages upward when advancing prices permit. The following examples of wages in relation to price levels indicate the system.

Year	Zinc Concentrate Price	Machine Men 8 hours	Contract Shoveler per 1200 lb can
1925	$55	$5.00	12½c
1927	42—	4.25	11 c
1930	31—	4.00	10½c
1931	25—	3.50	10 c
1932	$18 to $14	2.00	8½c
1933	31—	3.25	9 c
*1935	$26 to $30	3.55	10½c

* With the increase in zinc concentrate prices to $32 per ton, wages were raised 25 cents per day in October, 1935, and are still at the same level at the end of May, 1936.

* Secretary, Tri-State Zinc and Lead Ore Producers' Association, Miami, Okla.

† Presented to Annual Metal Mining Convention, Western Division, The American Mining Congress, September 25, 1935.

The machine man's or miner's wage is the key to the day rate for other employes, there being a customary differential of 75 cents per day below this for common labor underground, with other differentials above and below for other classifications. Accordingly, the present minimum wage for common labor underground is $2.80, and $2.50 on surface work, which are the minimum wages adopted under the Zinc Code. Only a small percentage of employes are classed as common labor. In a few cases machine men work on contract with piece rates based on the prevailing daily machine rate. Average earnings of these contractors are 25 to 30 percent above the day rate. Hoistermen, engineers, blacksmiths, carpenters, mill men, and other skilled workers make from $3.75 to $4.75 per day at present. Shovelers, who make up the bulk of underground labor, now earn, on the average, from $4.00 to $4.50 per day. Many shovel from 60 to 80 cans, and in a few instances 100 cans per day, thereby earning from $6.50 to $10.50 per day on the present piece rate. Any piece worker is paid at least the regular minimum wage.

The price of concentrates is made weekly in the open market and, necessarily, is a reflection of metal prices made on a world market. The Tri-State District mines the largest tonnages of the leanest grade of zinc-lead ores in the world. These have no precious metal content which can be sold at artificial government-fixed prices to help meet operating expenses or provide a needed profit. Obviously, the value of the concentrates is mostly represented by the expenditures incurred in mining and milling, for the raw material value per ton of such crude ore containing only from 4 to 5 percent of combined recoverable zinc and lead is very small. Labor is a large item of the operating expense, and necessarily, out of a given concentrate price, the amount which can be allotted to labor is restricted within narrow limits. Most of the workmen know enough about the items of cost to figure for themselves about what constitutes a fair wage on a given market for concentrates. Hence, they have been generally satisfied with the wage system that has long been in effect. And when some of them have undertaken a small mining venture on their own initiative—as many have done—they have had ample opportunity to learn the operators' problems at first hand. Thus the customary friendly understanding between employers and employes as to wages has provided no basis for dissention between them.

Employe Benefits

As an indication of at least some human interest in their employes, nearly all the major companies in the district have long carried group insurance on their regular employes. Under these plans, every employe who has worked for the company a year is entitled to a $1,000 life insurance policy. Until the past two or three years, these policies were payable in case of permanent, total disability just as in death, but the severe abuse of this provision by some persons during the period of unemployment caused its cancellation by the insurance carriers.

Also, the district has not been entirely devoid of the benefits which are possible through the social contact of persons with common economic interests. Some of the larger companies have encouraged the formation among their own employes of social, self-help organizations. In these organizations, each of which usually embrace the employes of one mine or plant, the total of the small monthly assessments paid by the members has been supplemented by the company to create a fund used principally to aid sick and needy families of these employes. Such organizations have functioned without any salaried officers, and have been actively controlled by the employe members.

Oklahoma Mining Law

Following the advent of statehood in Oklahoma, the legislature adopted a mining law, or "Mining Code" as it was called, for the regulation of mining in the interest of safety. At that time, coal mining was the only mining of much importance in Oklahoma, so the mining law was dictated largely by coal mine unions, and was adapted only to coal mines. Later, when zinc and lead mining became important in Oklahoma, this mining law, being administered by inspectors from coal mines, became very onerous and confusing to operators in this district. Accordingly, in 1928, the Governor of Oklahoma, under authority of the legislature, appointed a special committee to draft a new law or code to apply to metal mines, and on this committee were appointed representatives both of the employers and of the employes in the zinc-lead district.

This committee worked for some six months in gathering ideas and suggestions for safety and health which could be incorporated into a bill. At meetings of workmen, ground bosses, safety engineers, and others all made their contribution. Finally, a bill was drafted, printed, and widely circulated among the mining men, both employers and employes, and at least 90 percent of the workmen signed a petition endorsing it, and asking the legislature to adopt it. It had the approval and support of the officials of the American Federation of Labor in Oklahoma, even though they had no organization in the zinc-lead district. The bill was adopted by the legislature without a dissenting vote, was signed by the Governor, and became the law.

Later, the state of Kansas, not having a law applicable to the regulation of metal mines, adopted the Oklahoma Mining Law in full as a set of rules for the guidance of its mine inspector in that part of the zinc and lead district which lies in southeast Kansas.

It should be needless to state that this law was fair and thorough as a measure designed to protect the lives and health of the workmen, else it could not have had such a record. Under its provisions, the mine inspector has full authority to impose any regulations he deems necessary for the safety and health of the workmen, but with the provision that the operator can appeal to the district court for a review of any order of the inspector that he considers unfair or unreasonable.

Physical Examination of Employes

Prior to 1927, little if any attention was paid to the physical condition of workmen in the mines. If men were satisfactory to the foreman and could do their work, the prerequisites to employment were satisfied. In 1927, the U. S. Bureau of Mines, in cooperation with the Metropolitan Life Insurance Company, and the mine operators of the district, established a clinic at Picher for the physical examination of miners and other residents of the mining field. The primary object of this clinic was the study of silicosis and tuberculosis, which preliminary investigation had shown to exist to some extent among the miners. This study was carried on for a five-year period ending June 30, 1932, during which thousands of persons, including most of the employes in the district as well as many other persons, were examined and reexamined annually. Results of the first two years of these studies have been published as U. S. Bureau of Mines Technical Papers 545 and 552.

From the recorded histories of these men, it was evident that many of them had received their severe dust exposure in work in the old mines of the Webb City District before the time when water was used in drilling. However, these studies directed attention to the need for even better working conditions in the existing mines; hence a program was promptly inaugurated under the direction of the local safety engineers and the Bureau of Mines to improve the working conditions in the district. Necessarily, men who were found to be in such condition that they were a hazard to themselves and their associates, were taken out of employment in the mines. In some cases they were given light work of less responsible nature in the industry, and in some cases were directed to other types of employment. Where the employer felt responsible for a man who had long been in his employ, he made some provision for him, but in other cases, as of men who habitually shift from one employer to another, those who found themselves no longer employable had to shift for themselves. To the last employer, these may have been comparatively newcomers. Since they may have worked for many different employers and even for themselves during the course of their mining career, no single employer, including the last one, could be considered responsible for the accumulated disabilities which had crept upon them as a result of their work and advancing age.

The Bureau of Mines Clinic termi-

nated its five-year research period in June, 1932, and in July the institution was taken over by a group of the mine operators, who have continued to carry it on as a cooperative enterprise for making complete physical examinations. One physician, a laboratory and X-ray technician, and a clerk constitute the staff. It is now known as the Tri-State Industrial Examining Bureau.

Depression in the Tri-State District

Depression began to affect the Tri-State District long before the great slump in the autumn of 1929. From 1926 to 1927, the value of the output of the district declined from 55 million to 37 million dollars, and employment in mines and mills from an average of 10,200 men to 7,850. This decline continued to 31 million dollars in 1928, with an average of 6,250 employes. The year 1929 marked a slight advance up to 35 million dollars with 7,550 employes, and then the great decline culminated in 1932 with an output of four million dollars and employment for 2,100 men working less than half time for the year. By 1934 this had increased to nine million dollars, and 4,300 men (part time), and this year will be about 10 million dollars and about 4,100 men working, on the whole, more continuously than in 1934.

From these figures, it is obvious that the decline of operations required the elimination of some 8,000 men from the industry during the six-year period from 1926 to 1932. Naturally, such an adjustment was not easy. As mines gradually were forced down, men shifted about, and those who were unable to find employment elsewhere naturally included many who were least fit, among them being many old miners. Then, as the depression took hold in earnest after 1929, workmen's compensation for accidents came to be looked upon by workmen, former workmen, and even by the State Industrial Commissions as a means of *unemployment relief*. Insurance carriers were ruined or, to save themselves, were forced to withdraw from writing this business, and employers either carried their own risks or shut down. Employers who continued operations, or attempted to reopen their mines in order to do what they could to relieve the growing unemployment, were forced to require rigid preemployment and periodic physical examinations of their men. And, since operations came almost to a standstill in the summer of 1932, thereafter when employment did gradually resume, it resulted in the practical elimination of all men who could not pass the physical examinations.

It is only natural that men whose physical condition relegated them to the ranks of the unemployables—in so far as this industry is concerned—should be bitter about it, and many of their old bosses and employers shared their bitterness. Many of these men blamed the clinic or its successor, the examining bureau, for their plight, and, of course, failed to appreciate the combination of circumstances—depression, racketeering in workmen's compensation, and natural advance of age and accumulating disability — which all were responsible. These men became fertile ground for labor agitators and organizers who appeared upon the scene in 1933, when the new deal for the down-trodden man loomed in the offing.

It should not be overlooked that many companies and other employers also were eliminated by the depression, but these have had no champion and have had to accept their fate as best they could. Those who are still in the picture have had plenty of grief and can hardly be charged with responsibility for every man who has invested his years of life in the industry any more than they can be held accountable to everyone who has invested his money in this industry. Human losses and economic losses both had to be borne, and despite all that has occurred in the past few months to mar the picture, these have been borne, for the most part, nobly, both by the workmen and by their employers or former employers. It is doubtful if there is any part of the country where the fundamentals of independent and self-reliant Americanism still are so deeply rooted as they are among the people of this region.

M. D. Harbaugh

Living Conditions

It is well recognized by the residents of this district that living conditions in some parts of the mining field are far from satisfactory. But it would be difficult to blame this condition on the employers in the industry — although they may have some responsibility in the matter. As in most mining camps, the early boom days—and there were boom days in the Picher area from 1915 to 1919—brought in hordes of people who had to be sheltered in some manner. Some found living quarters in the nearby established towns of Joplin, Baxter Springs, Miami, and others, but many had to stay closer to the rapidly growing operations; hence tents, shacks, and temporary dwellings of other sorts sprang up in great numbers. There were no good roads then, as there are now, and only a few workmen could afford to live in town and attempt to drive back and forth from 10 to 25 miles to the mines, sometimes through mud sad to contemplate.

Mining leases, most of which were for only 10 years and were on restricted Indian land, prevented the acquisition of surface rights for the erection of permanent buildings. Also, no one could tell when a mining operation might require that dwellings which were erected be moved to make way for a tailing pile or mill pond. Furthermore, the individual mines were not expected to be long lived, and most of them subsequently proved to be of not more than a few years' duration. Hence no one was interested in erecting living quarters with any idea of permanence. Many men working in the mines built small houses—many of which were all too congested—for renting to their fellow workmen. And, of course, there were plenty of other persons on hand to provide the most quickly available facilities in order to cash in on the housing demand while it lasted.

The Picher mining field has lasted longer than people thought it would at first, although a very long procession of individual mines, prospects, and mining companies each have made a brief flash across the picture during the past 20 years, and have disappeared. These released many millions of dollars into the district—a large portion of which was spent on wages, directly or indirectly. Workmen who came to work at one property remained to work at others, and then still others as the earlier employers dropped out.

Living facilities which were intended to be only temporary became essentially permanent, particularly for the families of many of those workmen who, under the conditions previously described, gradually were crowded out of the industry after 1926. However, many employes who could live elsewhere if they chose, still prefer to live in close proximity to their work, and have homes that are much more comfortable than the casual observer may realize. Many others long since became residents of the nearby attractive towns, and still others live on small farms near and even right in the mining field.

The problem of housing every workman in an attractive dream home in the midst of a garden, probably is no more acute in this mining district than in most others, and in most cities. The difference lies in the fact that the more attractive residences in the mining district are scattered among several towns, and over a large rural area, and many of the less attractive are conspicuously lumped together in the heart of the mining field, whereas in a city residential areas are more or less zoned, and one can escape contact with what he does not care to observe.

The problem of overcoming the inertia of an independent, and generally self-reliant, population to encourage it to change its environment, is a matter that seems to be somewhat beyond the scope of mining engineering — even though these engineers are called upon to do almost everything. At any rate, the present operators in the Tri-State Mining District cannot be expected to assume responsibility for all the conditions that have resulted from 20 years of local history involving thousands of people in and about the region.

Local Relief Work

Relief work among the families of the increasing numbers of unemployed in the mining district was a serious problem beginning with the winter of 1929, but was handled entirely from local resources for the first three depression years. The Tri-State Zinc and Lead Ore Producers' Association, which embraces most of the mining companies, at that time was maintaining a staff of two nurses, with cars, under the supervision of a welfare director who handled the relief and welfare problem in the Picher area with funds supplied by the association and the companies. Later, the Red Cross assumed much of the burden as larger and larger numbers became affected, but the association continued its activities as well, and still continues them, although now with only one nurse. In 1933 the Federal Government set up the various direct relief and work relief agencies which since then have been active. Large numbers of the unemployed and unemployables in the mining field necessarily have been recipients of assistance from these agencies.

The association welfare nurse performs almost every imaginable sort of service which the residents of the mining field have occasion to request in matters of health, or in time of need. Her services are free to employes and unemployed alike, and these are accustomed to depend upon her for sympathetic assistance, particularly when all other resources seem exhausted. The fact that never has there been a serious epidemic of any sort among the residents of the mining field is largely due to wholesale administrations of state-supplied preventive serums to both children and adults, which have been made by this welfare agency whenever occasion demanded.

This continued maintenance of an agency to which the families of the workmen and others can always turn for kindly consideration of their many human problems, has served further to help maintain the harmonious relations between employers and employes.

Labor Organizations

With the passage of the NIRA, and its famous section 7(a), the national labor unions at once began the training of hordes of organizers to send into all unorganized industries to bring the workmen into the fold. A bright young unemployed man from another Oklahoma locality, seeing the opportunity presented by the unorganized labor in the Tri-State Mining District, immediately hied himself thither and began the organization of not one union, but several. He began with the employes and former employes in the mining field, and later added the lead smelter and lead plant workers of Galena and Joplin, to form a section of the International Union of Mine, Mill, and Smelter Workers, an affiliate of the American Federation of Labor. Then he organized the retail clerks into a union, and also the unemployed and the public relief workers, both men and women. Also, there was a woman's auxiliary to the Mine and Smelter Workers' Union. So there was a union for nearly everyone in the district.

The skilled organizer did a good job. He told the people repeatedly that under the Industrial Recovery Act they had to belong to a union; that the President of the United States demanded that they be organized for collective bargaining in the great drive for recovery. They must cooperate with the Government—that there was no option about it.

The mine, mill, and smelter workers were promised higher wages, shorter hours, better working conditions, and, above all, the elimination of the examining bureau or clinic, so that physical examinations would no longer be necessary and many unemployed men would again be able to get jobs.

The clerks were given equal promises of better things, and the relief workers and other unemployed—even destitute widows with families—were promised something if they joined and paid their dues. Repeatedly, threats were made, and apparently with reason, that those on relief would be cut off the rolls if they did not join the union—and, above all, keep their dues paid. So relief money paid by the Government was thereby actually diverted from hungry mouths of children to the union treasuries. It is common knowledge in the district that, for a long time, members of the unions had first call on the relief funds which Government agencies dispersed in the district, and that discrimination was rank in the administration of relief. Certainly, the extent of actual need was not the basis on which help was dispensed.

As an argument to show that much higher wages could be paid to the workmen, the union officials persisted in openly and brazenly telling them—and making a surprising number of them believe—that the price of concentrates actually received by the mine operators was many dollars more than that quoted weekly by the newspapers; that the papers were in collusion with the operators to publish only a fictitious price in order to keep wages down.

The men were told that the Oklahoma Mining Law was a farce—that the operators had pulled a fast one in getting it passed. A policy was started of filing scores of complaints with the state mine inspectors which kept the latter needlessly visiting mines where usually upon examination they found things all right. Doubtless there were and are honest criticisms of working conditions in some properties, and the conscientious operator—and most of them are human—is glad to have attention called to them and to correct them.

Early in the fall of 1934 a new hobby horse was set up to ride on for a while. The workmen were promised by the organizer something like $800,000 in back pay, which they were told was due them on account of wage adjustments which should have been made in August, 1933, over and above those which were made, when the President's Reemployment Agreement was signed and the working week was reduced to five days. The idea was that a literal interpretation of the President's Reemployment Agreement would give each man as much pay for the shorter week as he had received for the longer week before—but this ignored the fact that three wage increases already had been made in the two months prior to that which accompanied the President's Reemployment Agreement. This $800,000 necessarily increased with the passing months and was well over a million dollars when last heard from in May, 1935.

Merchants and service shops in the district were canvassed and proclaimed as pro- or nonunion, as the case might be; and boycott and other woes were invited by those that failed to enthuse over the new cause. Always in the back-

An Eagle Picher Ore Train Loading Custom Ore at Mary M. Mining Company's "Crystal" Mine

ground was the promise of certain elimination of the examining bureau.

The union officials were very active. They had to go to Washington for NRA conferences to fight for the rights of their constituents in the long-pending Zinc Code. They brought into the district as speakers, radical labor leaders, including some who many years ago helped deprive the miners of the Kansas coal fields of their jobs. Other outsiders of red stripe contributed their bit to inflaming the men — and their women, too—in the holy war of labor against capital. They wrote for the radical press of the country, and in some cases the material was gullibly printed by the more respectable press, depicting horrible working conditions in the mines, pitiful wages, and informing the world that the men lived only five years after starting to work in the mines and that they died by the hundreds of lead poisoning contracted there. In reality the ores contain only a fraction of 1 percent of lead, and no one ever heard of a case of lead poisoning from working in the mines or mills.

At one time or another, a considerable proportion of the men actually employed in the mines and mills did join the union and pay dues for a while. Many men, while not in much sympathy with unions generally, thought maybe they should join if the President of the United States insisted on it. And if there were to be a lot of benefits, such as were so plausibly promised, they didn't want to be left clear out in the cold. In fact, when the strike of May 8 so promptly shut down the operations, several hundred men who had been on the fence jumped into the union lot—just in case it might be a good thing. But few of them had any grievances against their employers, and most of them realized what strenuous efforts many employers had made to create work by operating their properties when prices were so low that they could scarcely make operating expenses even by destructive high grading of their mines. The large ranks of the union were filled by the unemployed who were hoping that the promises of jobs would materialize; and who can blame them much?

It should be understood clearly that during all this time, nearly two years, there was no controversy with the employers. And the employers did nothing to interfere with the rights of their men to organize for collective bargaining. In general, employers refused to advise their men on the subject, except perhaps, upon inquiry, to tell them that they didn't have to join a union to hold their jobs. And so the union ran along until March, 1935, when the promises had become threadbare, the treasury pretty well exhausted by the officials, and the most exalted and worthy official was charged with high treason to the organization, and suddenly left the district for good.

A few weeks later the international officers from the principal strongholds of this union in Utah and Montana came to take charge of the sinking Tri-State union. They made some efforts to deal collectively with "collective employers," but got nowhere, as each employer felt obligated under the law to deal collectively *only* with his own employes, or their authorized representatives, and *not* with the alleged representatives of just district employes (even though some of his own might be included) — together with a host of unemployed and relief workers. No attempt was ever made to bargain collectively under section 7(a), and later, after the strike was on, a representative of the National Labor Relations Board, who came to the district, stated that he had no jurisdiction because there had been no proof shown of violation of section 7(a).

Attitude of Employers

It should be noted that the mine operators had made every effort to cooperate with the NRA and almost en masse had signed the President's Reemployment Agreement early in August, 1933, raising wages for the fourth time in about two months, and thereby placing common labor well above the minimum wage provided in the then pending Zinc Code, with the usual differentials above the minimum for other classes of labor. Also, the 42-hour week was inaugurated, despite the fact that it caused much inconvenience in many operations.

The price of zinc concentrates reached $35 per ton in July, 1933, after having risen from $16 in February. It was $35 when the President's Reemployment Agreement was signed, but slumped almost immediately. At $31, the last of September, 1933, wages were lowered 25 cents per day on shift men, but were still kept above the President's Reemployment Agreement minimum for common labor. Despite the further reduction in price of zinc concentrates to as low as $24, this scale was maintained until the Zinc Code was put into effect April 8, 1935, when an increase was made in all underground classifications, which put these above the former President's Reemployment Agreement scale. So it is seen that the employers were doing their best to cooperate with the NRA, and even since the NRA became defunct, wages have been maintained at the Code levels.

The Strike

All during the spring of 1935, there were rumors of an impending strike. However, except for the bargaining efforts cited above, no demands were made upon the operators. Recognition of the International Union by the operators seemed to be the issue in the minds of the union officials. However, they never disclosed whose employes they represented for collective bargaining, nor even how many or what actual employes in the mines and mills of the district belonged to the union. No request was ever made for a vote to determine the agency to be recognized for collective bargaining under the NIRA.

On the afternoon of May 8, the principal officers of the union called at two or three company offices and left word that a strike would be in effect at midnight, and that whatever arrangements were necessary should be made to care for pumps, mules, etc. But most employers had no notice whatever and were as surprised as were a majority of their employes when trouble began in the morning.

At midnight, armed mobs of men appeared at the properties where night shifts were employed and, under threats of violence, forbade the men to go to work—most of whom were there ready to work as usual. The foremen, after some hesitation, not wishing to start what probably might have ended in bloodshed, did not attempt to let the men into the ground or to start the mills. The same thing happened at practically every property next morning when the regular day shifts reported for work. Armed mobs prevented the employes from beginning work, despite the fact that at least 85 percent and in many cases all of the actual employes were on hand and ready to work. The union officials broadcast the order for all strikers to "get on the relief," and by means of the publicity they gave to their cause, soon had sympathy funds and supplies coming to their assistance from other unions and perhaps from elsewhere. However, Government relief, by that time, was not so readily forthcoming as it had been some months before, and there apparently soon was a limit to the other contributions.

Perhaps if the operators had been experienced in labor troubles, they might have not been bluffed out so easily. At any rate, they did shut things down, and decided to leave them down until the situation cleared up. Everyone was confused. There was no known controversy between employers and employes, so the community quite naturally wanted to know what the trouble was all about.

In normal times, nearly every spring about strawberry picking time, or sometime later, the mines reach a point of saturation of concentrate stocks, so they shut down for a couple of weeks or more for a sort of tonic both to the men, and to the industry. So the strike was well timed to effect the usual spring shutdown. However, under the circumstances this shutdown was hardly a tonic. Men who had had too much of idle time the past few years, could ill-afford an enforced lay-off of indefinite extent. Certainly most of them didn't want it, and had had no voice in calling the strike. It is still a mystery as to just who voted the strike.

Picketing immediately began at all properties, and during the first few days there was some trouble when superintendents attempted to inspect their plants. Pickets were made up in part of recent employes, but largely of men who had long been unemployed, and in many cases included men who had never worked in this industry and some who evidently did not even belong in the community. Armed men swarmed over the district and trouble was afoot.

After a short time, the men who wanted to work and who were in the great majority realized that they were being kept from their jobs by an organized mob. They began to see that the

only way to successfully combat such a racket was to organize themselves, and that is what they did. Groups of these men held several scattered meetings over the district, and encountered some interference from strikers before a big, closely guarded rally at the Miami fair grounds May 26 finally started off the new organization with a bang. And thus was born the local Tri-State Metal Mine and Smelter Workers Union—an employes' organization, the object of which was to get its members back to work, and to cooperate with the employers in the industry, and not try to destroy them.

These men were in earnest and mere chance and quick action on the part of state police officers prevented more serious clashes than occurred with the members of the old union, which probably would have been too bad for both sides. The two organizations split families and neighbors by antagonisms that, unfortunately, will take years to allay. Feeling was so bitter that the local sheriff's forces soon found it impossible to handle the situation, so the National Guard was called to the scene, first on the Oklahoma side, and later in Kansas.

Under capable and fearless leaders, the new union grew rapidly, and in a short time effected working agreements with the operators to reopen mines and mills, and get men back to work. Many former members of the "old" union, as it is now called, who had joined it under pressure such as has been indicated, quickly affiliated themselves with the new organization that they might get back to work. This was no time to be out of a job.

On May 8, when the strike was called, there were 51 mills operating, with 4,213 men employed in the mining and milling branches of the industry, and 558 in the lead plants. The outlying mines and mills—e. g., those in southwest Missouri and some others, including a good many individual operations — were unaffected by the strike, hence several hundred men of the 4,213 were not thrown out of work. By June 8, 25 mills were again in operation, and by July 13, there were 46 mills operating and approximately 3,849 men were reemployed in mines and mills, and 458 in the lead plants. Of the men employed on July 13, 2,615 were back at work for their employers of May 8; 696 were experienced district men who, on May 8, either were working at some other property or had not yet been put back to work; 103 apparently were men who had not worked before in the industry; the remainder, estimated at 435, were "gougers," isolated workers and others unaffected by the strike. Since it is quite the custom for men to shift about from one operation to another, the percentage of men in this case, who, after the shutdown, were employed at a different property, was scarcely more than normal. A check-up on September 10, showed 55 mills operating and 4,867 men employed in the whole industry—including lead plants—146 more than at the time the strike was called. At most, there can hardly be more than a few hundred men who were working prior to May 8, who are not now back to work, and the men who replaced these are mostly district men who have every right to work in this industry, and who would have become reemployed with increasing demands for labor.*

Despite the fact that the activity in the industry now exceeds the pre-strike scale of operations, and the National Guard has long since departed, the strike is officially still in effect. Desultory picketing is still being done, and the men still loyal to the old union are yet made to believe they are going to "win" their strike. Their families are suffering, but they seem to prefer that to forsaking a cause that they somehow believe in, despite all that has happened. It is no less than tragic to their dependents.

There still is occasional trouble here and there, but for the most part all is quiet and the district has a perfectly normal appearance. The sheriffs' forces are keeping order by maintaining careful vigilance. Men who are suspected of being those who stole dynamite and blew up some power line towers several weeks ago, have been apprehended and are in jail awaiting trial. Strange enough, some of those under arrest were local officers of the old brotherhood.

The Tri-State mining industry hopes it is through with strikes. This one, an offspring of disordered minds dragging credulous men into a maelstrom of trouble out of which they were somehow led to believe they would be delivered into the promised land, left its victims, as usual, stripped by the storm. They were deserted by the leaders who got them into the mess, and who then advised them—as in the words of one prominent Oklahoma labor publisher and spokesman—"to stay out on strike until you whip hell out of this bunch." Except to the already unemployed, who had nothing to lose by voting for it, the strike caused tremendous economic loss, most of which is borne by the men and the families of men who lost from two weeks to two or three months of employment. A million dollars' worth of concentrates were not produced that would have been produced. Over $300,000 in pay checks to mine and mill employes alone were never issued, not to mention the auxiliary pay rolls that are represented by expenditures for supplies, power, etc. Postponing the production of the ore is not so serious to the operators as to the workman and the community generally, although the strike has been costly enough to the operators. There are always heavy expenditures which go on regardless of production, and, in addition, this required numerous special guards to prevent destruction of property. The costs to the states of Oklahoma and Kansas and to the local counties for the National Guard units and for special officers have been enormous. Yet the fact that, after a few weeks, 4,000 men got back to work with the aid of their protection, has been ample justification for this expense. But not the least of the results of the strike are the bitter feelings, torn families, and severed friendships that will not soon be smoothed over.

In closing these remarks, it should be repeated that in this strike there was no controversy between employers and their employes, and there was no known violation of section 7(a) of the NIRA. Representatives of the U. S. Department of Labor Conciliation Service were in the district at various times, and made efforts to settle the strike. But employers saw nothing to conciliate, and, with the help of their men who wanted to work, settled the strike, in so far as they were concerned, by reopening their properties as soon as they could under police protection, and reemploying most of their former employes. Of those who are not back to work, a few won't be taken back, and most of the others refuse to come back or are coerced from some source — in cases even by their wives—so they are afraid to return.

It appears to most people who have followed the course of events in the district the past two years, that the strike was called to "save face" after so many vain promises to union members had begun to pall upon them. Then, after the strike was in effect and proved to be a serious mistake, there was no face-saving move which could be made by the union officials to call it off, and so on it goes—*ad infinitum*.

Conclusion

What the future holds for this mining district, no one knows. Doubtless there are some conditions there that need to be improved; there always are in every enterprise. And with proper cooperation between employers and employes and with proper consideration for all other factors in the industry, most things that ought to be done probably can be done. But in any efforts at reforms, the fundamental bases on which the industry has been developed cannot be ignored. If it is to survive and maintain a prominent place in the economic life of the country, it must meet increasing competition from mines both in eastern and western states, and from ores that, in general, are of much higher grade. It must not be forgotten that the value in a ton of Tri-State concentrates is mostly represented by the expenditures incurred in producing it, and to a very small extent by the raw material or crude ore value. Hence there is a very real limit to the permissible labor expense as well as to every other expense item.

Probably the long history of friendly labor relations in the district was bound to have a break in these days of unrest. Perhaps what has happened in the past few months may result in closer contact between employers and their workmen, and a more conscious effort than in the past to practice between them the Golden Rule—which, after all, is the secret of happy industrial relations.

* In May, 1936, 63 mills were operating with 5,000 men employed in mines and mills, in addition to 600 at the Joplin Lead Plant and Galena Lead Smelter.

Of All Things . . .

Maybe there's significance in the fact that the Supreme Court is still the most popular place in Washington. . . . Since last October, when the present court term opened, 329,496 visitors have trooped through the new building. . . . It's a new all-time record for any Washington building. . . . The "visitors" are tourists . . . who are voters back home.

Any way you take it, Uncle Sam is up against it. . . . The poor want to work for him . . . the rich want to stop working for him. . . .

A former Vice President made history when he said what this country needed was a good 5-cent cigar. . . . He's wrong. . . . What it needs is some inefficient tax collectors. . . .

It took the Treasury several weeks to figure out how much revenue the new tax bill would bring in. . . . It won't take that long to spend it. . . .

It's a good thing the elephant is bigger than the donkey. . . . Three party publicity chiefs are riding the donkey to the campaign wars . . . 26 are now perched on the elephant. . . . But before it's over it will take a herd of elephants and a trainload of donkeys to carry all the "news" to the people. . . .

A western Congressman has introduced a bill which would establish the office of national poet laureate with Congressman Stephen McGroarty, of California, as poet. . . . Poetry is all right, but what we need is something more practical, like, for instance, a national solver-of-unemployment. . . .

Insurance experts tell us that life expectancy in America is now 61 years. . . . Push it up four more years and we'll all live to get a pension from the Government. . . .

There'll be poetic justice in the coming Democratic national convention for Senator Bennett Champ Clark, of Missouri, who is to be chairman of the rules committee. . . . It is his committee which must first pass on the proposed abrogation of the two-thirds rule. . . . Just 24 years ago, at the Baltimore convention, his father was defeated for the nomination by Woodrow Wilson only because it required two-thirds of the delegates to nominate the candidate. . . .

Prof. Rex Tugwell's 10-year-old daughter is running a dog laundry in Washington. . . . And certain folks have been unkind enough to hope her father joins her after November 4.

Tax money goes for a variety of things that you wouldn't think the Federal Government ought to have a hand in. . . . The smallest item in the legislative appropriation bill, for instance, was $2 for two neckties for Vice President Garner's chauffeur. . . . And from WPA funds . . . $14,762 to build a lily pond in Placerville, Calif. . . . $500,000 to make bridle paths "more attractive" in Queens Borough, N. Y. . . . $9,478 to drain a piggery at Waltham, Mass. . . . and millions for projects which include teaching of eurythmic dances, tap-dancing, paintings to make jails more attractive, and theatricals. . . .

Congressmen spent a couple of days recently debating the question of selecting a "national tree." . . . Suggestions ranged from the giant California sequoia to the Texas mesquite. . . . The average American taxpayer probably figures it ought to be the spiny cactus. . . . That's what it feels like he's sitting on these days.

Along the Potomac

Wheels of

THE revolt of the Senate Finance Committee on the revenue bill of 1936, as it came from the House, and the elimination of the Guffey Coal Act by the decision of the Supreme Court, were easily the outstanding features of the month of May in Washington.

At the present time the situation on the revenue bill is crucial and no one can tell whether the Congress is faced with a prolonged session necessary to enact a thoroughly considered law, or whether a compromise will be effected as between the administration and the members of the Finance Committee.

On April 29 the revenue bill passed the House by a 267-to-93 vote. For a bill which departed so widely from tried and proven methods of tax-taking, its consideration in the House had been brief. Op April 20 the Senate Finance Committee began public hearings on the bill, and a storm of protest was registered by representatives of corporate enterprises. The hearings concluded on May 8, and by this time a majority of the members of the Finance Committee were definitely opposed to the undistributed earnings feature of the bill.

The mining industries were represented in appearances by A. G. Mackenzie, secretary, Utah Chapter, American Mining Congress, Salt Lake City, Utah; Donald A. Callahan, representing Idaho Mining Association, Wallace, Idaho; Julian D. Conover, secretary, the American Mining Congress, Washington, D. C.; and M. E. Peloubet, certified public accountant, New York, for the American Mining Congress.

Mr. Mackenzie said in part:

"Mining properties in the West are customarily brought into operation through the formation of corporations to develop claims presumed to contain metals in commercially recoverable quantities. The process begins with the location by a prospector of mining claims which indicate to him the presence of recoverable metals. He may have, and usually has, spent years in search for the claims, and is, therefore, probably not a young man. In most instances, he must spend more time and much hard labor to uncover a showing which will warrant the next step in the development of his ground. Such a showing having been made, he faces the necessity of spending money, which in all likelihood he does not possess, to prove and develop his discovery. So he brings his proposition to the attention of his friends and others, and if the showing impresses them favorably a corporation is formed to develop and operate the claims.

"The corporation contracts to expend a specific amount of money in the equipment and development of the property within a specified period and pay the owner a specified price for the claims out of the earnings of the corporation as and when earnings are realized. Such payments take precedence over dividend distributions by the corporation. * * *

"I believe the enactment of this bill in its present form would greatly discourage and possibly extinguish investment in such enterprises as I have discussed. * * *

"It is not a matter of theory with us but of actual results. These will be harmful to our metal mining industry and to our communities. That is the one thought we wish to leave with you, as we believe you do not wish to be unfair to us and harm us in this way."

Mr. Callahan said in part:

"I am here especially to plead with you on behalf of the smaller corporations which are engaged in the development of mining properties. I am here to ask that you do not blanket the entire nation with a system which is designed to correct what some people regard as an economic and social evil. I make the assertion that this blanket policy will affect most adversely the corporations which are fighting for existence and seeking to establish themselves in the position where they will in time become contributors to the nation's revenue. In the State of Idaho we have vast undeveloped areas which contain minerals. It may surprise you to learn that in central Idaho there is a primitive area

at Washington, D. C.

Government

upon which the foot of a white man has never trodden. From the upper reaches of the Salmon River through a vast mountainous country there lie hidden treasures which man today is seeking to recover from forbidding nature. Hundreds of small corporations today are prospecting and developing these areas. They are the companies which will be most adversely affected by the passage of this bill. Mr. Mackenzie has told you of the method by which mine financing is accomplished, and it must be quite clear that to impose the maximum tax provided in this bill upon earnings of these corporations which are devoted to payment for properties and the erection of operating and reduction plants, will make it a practical impossibility to finance future operations."

Mr. Conover, after speaking on the general features of the bill as affecting the mining industries, made three specific suggestions for the clarification and improvement of the tax bill, relating to the following features:

1. The time for making distributions upon which dividend credits are based.
2. The treatment of inventories.
3. Simplification of corporate structures.

In discussing the time for making distributions under the bill, he said:

"It is generally difficult and sometimes impossible for a mining corporation to determine its income with any degree of accuracy before the close of the year. Final returns from ore shipments to the smelters may be delayed 60 to 90 days, and other items entering into the net income are not determinable for a similar period. As a result, the corporation cannot distribute its earnings before the end of the tax year without a great amount of speculation and guesswork. * * *

"If it is not felt that some such period as two and one-half months after the end of the year could be allowed within which to make full distribution of income, there should in any event be an additional period, possibly three months, within which to make distribution of at least one-fourth of the amount of income for the year. * * *

"A further and very serious problem arises in respect to the review of tax returns and assessments of additional taxes. * * *

"The corporate taxpayer, when it comes to make its return, figures as closely as it can what its tax liability is; but the complicated provisions of the law and the regulations thereunder make it exceedingly difficult for the taxpayer to have any confidence that this determination will be acceptable to the Commissioner of Internal Revenue. As a matter of fact, very few, if any, returns involving substantial tax payments are found acceptable. * * * The settlement of such differences often requires months, if not years. * * *

"Under this bill, any additional determination of net income will carry a heavy penalty, raising the rate of tax upon the entire net income. In many cases the additional tax will be equal to one-half of the additional income so determined.

"To avoid this unfair treatment * * * we urge that the corporation be accorded the right, within a reasonable period after final determination of additional statutory net income (and except in case of fraud, to distribute to its stockholders an amount equivalent to such additional income, and in case such distribution is made, that no penalty tax be assessed. We feel that this is a matter of simple justice, is sound public policy, and is vitally needed in view of the complexity of the law and the utter impossibility of its being sufficiently understood by the taxpayer to enable him to prepare his return with any certainty that it will be accepted."

And as to the treatment of inventories:

"Mining concerns, and more particularly those engaged in processing or metallurgical treatment of mineral products, commonly require large quantities of materials in process. As suggested by Senator King just now, a smelter requires 60 to 120 days to produce refined metal from crude ore,

and must, therefore, keep from two to four or more months' production constantly in process in the roasters, sintering machines, furnaces, and so forth.

"The stock of such material in process, together with a suitable reserve against contingencies which might produce a shortage of supply, is usually referred to as the 'normal stock,' which must be carried at all times and without which operations could not be conducted.

"If, as metal prices vary, the metal contents of this material in process are constantly revalued and such changes in value are reflected in income, wide fluctuations in income may result from this factor, although the physical character of the normal stock and its function as an integral part of the operating plant has in no way changed. To avoid such distortion of earnings statements, a method has come into common use under which this normal stock is carried on the books at a constant price. It becomes a stable, fixed asset in the accounts, just as it is in the actual operations."

In the matter of simplification of corporate structures he discussed section 112 (b) (6) as accepted by the Senate in 1935, and pointed out certain amendments needed in order that corporate subsidiaries may be liquidated or merged with the parent company without undue tax.

Mr. Peloubet discussed in detail the treatment of inventories under the administration of the revenue laws, and suggested an amendment to section 22 (c) of the proposed revenue act of 1936, as follows:

> "Including the normal or necessary stock method in those industries in which the taxpayer consistently keeps his accounts in accordance with such method, provided that the taxpayer shall elect his method of stating the inventories in his first return under this title."

As the bill now stands, the Finance Committee of the Senate, but without approval of administration authorities, it provides in brief as follows:

1. A graduated 15½ to 18 percent tax on corporation net income, as contrasted with the present rates of 12½ to 15 percent.

2. A 7 percent "surtax" on undistributed income of corporations.

3. Removal of the exemption from normal tax of corporate dividends; shareholders would thus pay the full 4 percent normal tax as well as surtaxes.

4. Continuation of the full capital stock tax of $1.40 per thousand on declared value, and continuation of the excess profits tax as in the present law.

5. Increase of 1 percent in the surtax rates on individual incomes from $6,000 to $50,000, with no change in the present surtax on incomes from $4,000 to $6,000 and on incomes above $50,000.

6. Retention of the personal holding company tax section (Sec. 351) but bracketed rates from 20 percent to 60 percent are reduced by 7 percent.

Price Discrimination Bills

When the Senate passed the Robinson bill (S-3154) on April 29, there were 10 amendments embodied which had been placed in the bill on the floor of the Senate. Among the amendments were the Borah-Van Nuys bill (S. 4171), and of particular interest to mining the King amendment, which exempts the sale or purchase of crude minerals or metals in the form in which they are loaded for shipment.

Another interesting amendment was that by Senator Vandenberg (Rep., Mich.), which provides that the price discrimination prohibited on account of quantity sales, would not apply where such commodities are sold for further manufacture and in the production of a new product to be sold to the public.

In the House, the Patman Bill, H. R. 8442, passed without a record vote on May 28. Committee amendments were accepted eliminating the objectionable Section 5, which would have made illegal the use of basing-point price systems, and also the classification section.

All amendments offered from the floor were promptly voted down.

The King amendment, exempting minerals and metals, was not offered and the bill will go to conference with the Robinson bill, where it is anticipated that the amendment will receive constructive attention at the hands of the conferees.

Walsh-Healey Government Contracts Bill

Although this legislation was tabled by a vote of the House Judiciary Committee in the middle of the month, there has been further activity in an endeavor to enact some form of a bill which will require compliance with wage and hour requirements on the part of contractors engaged in construction or in the furnishing of supplies to the Federal Government.

Stream Pollution Legislation

While enactment of this form of legislation has not been anticipated in this session of the Congress, further hearings have been held the latter part of this month in both the House and Senate on stream pollution bills introduced by Representative Hillister (Rep., Ohio), Representative Vinson (Dem., Ky.), and Senator Barkley (Dem., Ky.). These bills contemplate studies, one under the Corps of Engineers of the Army and another under the Bureau of Public Health, in cooperation with the various states, over a period of years, with a view to the development of plans for the elimination of municipal and industrial pollution.

Suspension of Annual Assessment Work

Public Law No. 532, approved by the President April 24, provides for the suspension of assessment work for the year ending July 1, 1936. The bill is identical with that enacted last year, and while it was thought that there would be no such enactment this year, the representatives in Congress from the western states were prompted to action by appeals from their constituents.

Interior Department Appropriation Bill

While the Senate accepted the report of the conferees on this bill more than a month ago, the consideration of the conferees' report was delayed in the House until very recently, when the House refused to approve approximately $61,000,000 for reclamation projects, and sent the bill back to the Senate. Upon action of the Senate the bill has again been made subject to conference with the instruction that the Senate conferees insist upon their amendments. Action taken thus far does not affect the increases in appropriations made by the Senate for the United States Geological Survey and the United States Bureau of Mines. These increases still stand in the bill as it was passed by the Senate.

New Guffey Coal Bill

Within 48 hours after the decision of the United States Supreme Court declaring the Guffey Coal Act to be unconstitutional, Senator Guffey (Dem., Pa.) introduced what has been termed "a clipping and paste-pot bill," which is essentially the same as the Guffey Coal Act with the exception that the monopolistic labor provisions were eliminated.

The preamble of the bill is devoted to its application to the movement of coal in interstate commerce only, and the commission is increased from five to seven members—three for the Federal Government, two for the producers, and two for the workmen. A commission so formed is held by a number of the members of the House of Representatives to be ill-suited to the judicial treatment of the problems of the bituminous coal industry.

Representative Vinson's bill was reported by the Committee on Ways and Means on April 26, and will probably be passed by the House. Senator Wheeler (Dem., Mont.), chairman of the Committee on Interstate Commerce of the Senate, has been quoted as stating that he does not anticipate enactment of another Guffey Coal Act by the present session of the Congress. The bill still contains the provision for a 15 percent tax on the sale price of the coal, with a 90 percent drawback in the event the producer complies with the provisions of the code. Assistant Attorney General John Dickinson is quoted as stating that with the labor provisions removed, the bill in its present form is constitutional.

The Montreal Mine SAFETY Program

By C. A. BJORK *

THE Montreal Mine is an iron ore mine located in Montreal, Iron County, Wisconsin, at the west end of the Gogebic Iron Range. It has been operated since 1886.

The safety of its employes is securely established as the first consideration in all the operations of the Montreal Mining Company. This happy situation is the result of an aggressive safety program carried on over a period of many years, and backed up 100 percent by the management from top to bottom. The whole organization is "sold" on accident prevention.

The community consists of about 2,000 people, representing 28 nationalities. The mining company has taken an active interest in providing good schools, churches, recreation, sanitation, landscaping and reforestation. In addition to the private residences in Montreal, the mining company owns 141 homes which are attractively painted and kept in good repair. About 475 men are now employed at the mine.

The Montreal Mine is actually three mines served by a central hoisting shaft. It extends about 10,000 ft. along the strike of the iron formation and is 3,000 ft. deep. Because of the numerous scattered orebodies, long haulage ways in rock are required on each level. Top slicing, open stoping and sub-level caving are the mining methods generally used. Double drum electric slusher hoists have replaced hand mucking, and to a considerable extent the loading of cars at chutes.

Accident prevention is under the direction of a safety engineer who has a full time underground inspector as an assistant. On these two men lies the primary responsibility for the efficient functioning of the safety program.

Aiding the safety engineer and helping him plan the program is the central safety committee. It holds regular meetings once each month and consists of the superintendents, all department heads, the safety engineer and his underground assistant. It reviews the safety results attained the past month and carefully analyzes all accidents reported. Each accident is classified as to whether it is thought "avoidable" or not. "Near accidents" are also reported because they involve all the elements of an accident except the actual injury. All recommendations for improving the safety program or changing the standard safety rules are passed on by this committee. The regular order of business is as follows:

Call to Order.
Roll Call.
Reading of Minutes of Preceding Meeting.
Review of Accidents Since Last Meeting.
Review of "Near Accidents."
Report of Hazardous Conditions or Places.
Report of Skip, Cage and Shaft Inspections.
Report of Tests of Safety Catches on Cages and Crossheads.
Missed Hole Report.
Fire Inspection Report.
Report of Hoisting Rope Inspections.
Report of Discipline Committee.
Discussion of Safety Proceedings and Accident Reports from Other Mines.
Report on Condition of Injured Employes.
Progress of Jobs Pertaining to Accident Prevention.
Discussion of Accident Record of Each Department.
Unfinished Business.
New Business.
Adjournment.

Additional safety meetings are held once a week with the underground foremen who are on night shift that week. The safety engineer acts as chairman of these weekly meetings and leads in the discussion. Each foreman reports fully on any accidents or near accidents that may have occurred in his territory since the last meeting and is asked to give his idea of where the responsibility lies. Safety conditions in the mine are freely discussed and many suggestions for improving the accident prevention program are made by the foremen. These suggestions are later reviewed by the central safety committee which takes definite action on them.

A continuous inspection of the property is carried on to locate possible hazards before an accident occurs. The safety engineer and his assistant devote half their time to this work, but the employes and the supervisory staff, due to the active educational program, are all on the lookout for dangerous conditions. To protect against a fire underground, experienced men make a thorough inspection at the close of each night shift. They are on the lookout for incipient fires and electrical circuits where some one may have forgotten to shut the current off. A special inspection, both underground and on surface is made every six months by a committee composed of the head mining captain, chief engineer, chief electrician, master mechanic, the safety engineer and his assistant. This inspection committee makes a written report to the central safety committee covering its findings and recommendations. In making this inspection, the following hazards are kept particularly in mind: Fire, loose ground, mechanical, electrical, transportation, guards, timbering, unsafe methods, and lack of cleanliness.

The Montreal Mine has adopted a number of preventative measures designed to eliminate accidents. Guards, railing, toeboards, stages, head boards, and forepoles are used wherever the possibility of an accident exists. The storage of explosives and the whole procedure of blasting, are controlled by explicit rules which reduce the hazard to a minimum. Everyone entering the mine is required to wear hard-toed shoes or boots, a hard hat, goggles and gloves. Men working where there is danger of falling, must wear safety belts. Timber framers wear protective leggings.

The underground transportation system presents many possibilities for accidents. At the Montreal Mine a block signal system is used to control all train movements and a carefully prepared set of rules is in force governing the actions of motormen and other employes who work on the main haulage levels. In addition, wherever possible, men, timber and supplies are handled on a special sub-level above the haulage level. This relieves congestion and makes for greater safety.

All the main travel ways underground are kept well lighted with electric

* Safety Engineer.

lights. On the haulage levels, "safety zones" or openings along the side of the track are cut out not more than 100 ft. apart, and their location is indicated by a blue light, so that anyone walking has a safe place to remain while a train goes by. Cleanliness and order in all operations is insisted upon. No job is considered completed until the place is "cleaned up."

Actual carelessness and indifference to the accident prevention program is unusual, but when an employe has definitely violated a safety rule, he is sent at once to the "discipline" committee which is composed of the superintendent, head mining captain and safety engineer. Here he is required to give his explanation of the violation. The committee investigates if necessary and decides on the penalty, which may be a lay-off of from one day to a couple of weeks. For minor violations, a lasting impression is sometimes made by requiring the employe to visit the general superintendent at his office and discuss the accident prevention program with him.

A thorough medical examination for the prospective employe and a careful check-up on each employe by the doctor once a year has been found of great value in reducing accidents. Men with serious mental or physical defects are not hired. After each re-examination, the doctor advises the employe of any change in his physical condition. A man's work is changed when his physical condition is found to make his continued employment on a particular job unsafe for himself or his fellow workmen.

Along with careful inspections for unsafe conditions, and all the preventative measures possible, a thorough and continuous educational campaign rounds out the accident prevention program. Each new employe is given a printed booklet containing the standard safety rules. He signs for the booklet and promises to read and study the rules. From time to time he is quizzed by the safety engineer on the rules pertaining to his work. Electrically lighted bulletin boards containing the best posters and accident prevention literature available are located at various places on the property where the men tend to congregate. The material on the boards is changed frequently. A cartoon or comic strip helps maintain interest in the bulletin board. The employes' education in accident prevention is also aided by personal contact with the safety engineer and his assistant, and by group discussions led by the engineer. Lessons are learned by studying the reports of accidents and accident prevention work from other mines, and also from the various safety magazines and the press. The safety engineer selects all ideas of possible merit and presents them for discussion at the next committee meeting.

Through the cooperation of Mr. Frank Crawford, District Director of the U. S. Bureau of Mines, every employe has completed the Bureau of Mines' course in first aid to the injured. To facilitate the care of the injured, first aid cabinets containing supplies are kept at convenient places both underground and on surface. Every foreman carries a small first aid kit, for minor injuries. A stretcher is kept at each shaft and the company ambulance is immediately available in case of a serious accident. The automatic telephone system with 100 telephones underground and throughout the property, makes it possible to quickly summon aid when an accident occurs. The local doctors have a well equipped office on the property, but major operations and necessary hospitalization are taken care of at a private hospital about five miles from Montreal.

Five McCaa oxygen breathing apparatus, maintained in operating condition, are supplied for fire fighting, and arrangements have been made to secure additional apparatus from other mines on the range in case they are needed. A specially selected crew of men, including most of the foremen and heads of departments have been given the Bureau of Mines' training course in fire fighting. These men are given a workout in the apparatus at regular intervals to keep up efficiency and confidence in the equipment. "All Service" gas masks are supplied for work in atmospheres not lacking in oxygen. Brattice cloth, a portable emergency telephone system, a carbon monoxide detector, an inhalator and a high pressure oxygen pump are kept in readiness for fighting fire. In addition, soda acid and carbon tetrachloride extinguishers are kept in centrally located places underground and on surface. Water under pressure is piped to every working place in the mine for drilling, and this water is always available for fire fighting. The stench system with ethyl mercaptan as the active agent in the compressed air lines, is used to notify all men underground to come to surface at once.

Because the safety and well being of the underground employe is dependent on an ample supply of dust free air, underground ventilation and dust prevention are considered a part of the accident prevention program. This work is in charge of a specially trained full-time engineer. The primary ventilation system is designed to supply an adequate quantity of air at relatively low velocity to the main parts of the mine. The air comes from surface through a series of old open stopes and after circulating around the mine is exhausted through the three upcast shafts. There is a fan at each shaft providing the mine with a total air flow of about 185,000 cu. ft. per minute. Auxiliary fans, 12 in. and 16 in. in size, are used with metal pipes and canvas tubing to ventilate dead ends. Automatic doors control the air currents on the tramming levels. Samples of the air from various parts of the mine are taken periodically, and analyzed for oxygen, carbon monoxide, and carbon dioxide content. This work is done locally with a standard gas analysis apparatus.

The circulation of dust formed by blasting is controlled by "water blasts." The water blast discharges a mixture of compressed air and water into the smoke and dust laden air, causing most of the particles to settle on the floor. A water curtain, formed by a series of water atomizers is also used to clear dust and smoke from the air. All drilling is done with wet machines and hollow steel. The breast and muck pile is carefully sprinkled with water after each blast. Dry working places and air passage ways are sprinkled daily. Miners drilling in rock wear "air line" respirators while drilling. All men underground carry the ordinary felt pad respirators, and are required to wear them while drilling, slushing, returning to the breast after blasting and whenever there might be an abnormal amount of dust in the air. Dust counts are made at regular intervals in various parts of the mine and show the dust prevention measures to be quite efficient. The dust counts are made with the standard apparatus and technique recommended by the U. S. Public Health Service.

Safety in the home and on the highway is sponsored as part of the accident prevention program at Montreal. Special posters dealing with these subjects are kept on the bulletin boards. The safety engineer gives talks to the grade and high school assemblies and at irregular intervals, public safety meetings are held with all members of the family in attendance. A safety picture show, and a capable speaker on accident prevention are usually a part of these meetings. The safety engineer also acts as chairman of the engineering committee of the Iron County Highway Safety Council.

The accident prevention efforts of the Montreal organization have been rewarded on several occasions by the mine receiving the Joseph A. Holmes Association Safety Award. The most recent award was received in March, 1936.

On March 15, 1936, the departmental record of days worked without a compensable accident was as follows:

No. 4 shaft underground....	104 days
No. 5 shaft underground....	249 days
No. 6 shaft underground....	997 days
Mechanical department	417 days
Electrical department	3,290 days
Surface department	437 days
Blacksmith and drill shops..	3,517 days

The results of the accident prevention work at Montreal are gratifying, but accidents though more infrequent still occur. Only the continued organized cooperation of the management, foremen, workmen, committees, labor representatives and leadership by the safety department can prevent them. The accident prevention program at the Montreal Mine is dedicated to this end.

● PENNSYLVANIA RAILROAD recently exhibited America's newest stream lined coal burning locomotives at Chicago Union Station.

AIR CONDITIONING†

By H. G. CONRAD *

THE subject of "air conditioning" and its relation to mine operation may, at first thought, appear rather obscure. When we think of "air conditioning," our mental picture is one of ultra-modern homes, apartments, or public buildings; stream-lined trains, luxurious ocean liners, or other situations far removed from the kind of environment associated with mines.

We think of air filtered, washed and humidified, warmed or cooled according to season for human health and comfort, and we wonder what possible connection can the subject of "air conditioning" have to the work-a-day operation of a coal mine.

Nevertheless, the subject of "air conditioning" for industrial purposes is not, exactly, a new thing, and even coal and metal mines have experimented, more or less successfully, with air conditioning in some form or other for a number of years.

It is true that the treatment applied to the ventilating current of a coal mine may have objectives different from that which is applied for other industrial requirements or simply for creature health and comfort, as in homes and buildings.

Most operating managers have had some experience in introducing humidity into the ventilating air current of mines in the winter months for the purpose of reducing the amount of dust present in the ventilating current and to saturate the dust accumulations on floors, ribs, and timbers, so that the dangers of dust explosions would be minimized.

Most efforts in this direction were rather imperfect in result and failed entirely to accomplish their purpose or introduced bad features, inherent in themselves, that discouraged their continuance. Often the mere introduction of a jet of live or exhaust steam in or near the foot of the downcast was expected to accomplish the desired result. Unless the volume of steam, so released, was sufficient to raise the temperature of the incoming air to that of the mine temperature, the air was unable to carry the desired content of moisture and the incoming steam was merely condensed within a comparatively short distance from the point of emission.

To overcome this condition, some installations first passed the air across a system of heating pipes or radiators before introducing steam into the current, the air thus warmed having capacity for carrying a much higher load of moisture than when not so preheated.

Many of these installations fell into disuse, after a time, some because results were disappointing, some because of the harmful effect on the nearby roof, and others because boiler plants were not adequately built to meet these additional requirements. Besides, Bureau of Mines investigations revealed that the wetting of coal dust, besides being difficult of accomplishment, proved to be not as effective in checking dust-propagated explosions as was formerly believed, and that the thorough and adequate application of rock dust proved to be a better form of insurance against this danger.

Although we may not have thought of it in these terms, the air-humidifying attempts so made were "air conditioning."

More recently we have been introduced to a different type of air conditioning for coal mines, and for quite a different purpose than that mentioned above.

Instead of warming and humidifying the incoming air, the process is reversed and the object is to cool and dehumidify this air. The application of this treatment of the air is primarily for the purpose of preventing the disintegration of the mine roof, which so often occurs, during the hot summer months, in certain types of roof. Most of us are familiar with this kind of roof trouble. The effects are often troublesome, expensive, and dangerous. Roof which has given no trouble during the winter months becomes an operating liability of importance. Loading and cutting machine performance is affected, timbering and deadwork cost is augmented, danger to workmen is increased, and preparation difficulties are multiplied because of roof rock mixing with the coal.

The cause (or causes) of this effect on the roof, which is so definitely associated with summer weather, is (or are) not easily explained. Students of the subject have differed in their views, some holding to the theory of expansion and contraction, caused by temperature variation; some to the wetting of the roof rock weakening its mechanical strength; others associating chemical action with the disintegration of the roof; and still others who believe that some combination of these various factors is responsible.

Those who contradict the theory of expansion and contraction, due to temperature variation, point to the fact that even wider temperature variations occur during the winter season with no adverse consequences.

The wet-roof theory is disputed by those who have experienced conditions where roof was continually wet, the strength apparently not being affected thereby, whereas other sections of roof of the same character subject to ordinary conditions gave much trouble even though observation showed that bedding planes of the freshly broken roof were relatively dry.

Contradictions to the chemical-action theory are based on the belief that the composition of roof shale in its natural state consists almost wholly of such chemically stable compounds as silicates, carbonates, and sulphates, and that the small percentage of constituents subject to hydration or oxydation, if any, would not account for the prompt and extensive effect on the rock in question.

Combination theories are admittedly vague and indefinite.

There are still other possibilities not mentioned above which have been suggested. For instance, alternate wetting and drying of the roof producing effect not obtained when either continually wet or continually dry. Another suggestion is that only "green" roof is affected by "sweating," seasoned roof being able to "take it." This, if true, would seem to indicate chemical changes. Again, temperature alone is credited with the responsibility, low temperatures being harmless, high temperatures destructive. In this case, expansion alone seems to be the destruction agent. When the mine temperature rises considerably above the normal strata temperature, the roof absorbs this warmth, expansive forces set up tremendous internal stresses and something has to yield. Plausible enough, but offset, on the other hand, by the fact that observations of mined-out areas which have heated almost to the point of spontaneous ignition

* Knox Consolidated Coal Corporation.
† Presented to Coal Convention, American Mining Congress, Cincinnati, Ohio, May 14, 1936.

have not evidenced the destructiveness to roof which would be expected according to the temperature explanation.

We are forced to the belief that no one knows for sure just what causes roof to fall in the summer time. We can all agree on one point, however, and that point is this: If we could temper the ventilating current before we sent it through the mine, reducing the temperature to approximately that of the mine workings, we should then, logically, experience no roof trouble whether the causes be any of these mentioned, singly or in combination.

A method of accomplishing this form of air conditioning was first installed in Indiana at the mine of the Saxton Coal Mining Company, near Terre Haute, nine years ago. This installation, details of which were worked out by Messrs. Fletcher and Cassidy, of the Allen and Garcia Company, and described by them in a paper read before the American Institute of Mining and Metallurgical Engineers at their New York meeting in February, 1931, has been in use ever since and has fully justified its purpose according to Mr. Cassidy, who is now superintendent of this mine.

The fan at this mine is operated blowing, in common with most mines in the Central West, and the cooling system was installed on the surface, in an extension of the intake air drift to the fan.

An abundant supply of water, having a temperature of 56° F. was available for cooling, and is utilized by means of self-flushing spray nozzles which fill the spray chamber with a finely divided mist of the cooling water which comes into intimate contact with the incoming air, affording an efficient exchange of heat. Zig-zag baffles or louvres are placed between the sprays and the fan, to prevent entrained moisture being carried into the fan. The amount of cooling water used and the number of sprays in operation is controlled automatically, to maintain the desired uniform temperature in the air entering the mine.

With this installation as an example, a somewhat similar system of air cooling was installed at the Knox Consolidated Coal Corporation's No. 2 mine, located near Bicknell, Ind., during the summer of 1935. At this mine the sprays were installed in a brick-lined section of the intake air course near the foot of the downcast shaft. Water for cooling is obtained from sealed-off, worked-out sections of the mine where water has accumulated. This water, due to the fact that the areas, in which it was impounded, are tightly sealed and air excluded, is alkaline and hence, noncorrosive. The available water supply being underground, the most economical installation for the sprays was in the mine rather than on the surface. This location also has the advantage of giving the air a small amount of precooling by its passage down the airshaft.

After accomplishing its purpose, the cooling water is returned to a second sealed area, where its heat may again be dissipated into the strata and the pumping process reversed, as necessary, during the summer.

This cooling system was only partially completed last summer, so that performance data is not available, but during the period of its operation a noticeable lessening of roof falls was observed. It is planned to increase the number of spray nozzles and add automatic controls instead of the manual controls used last summer.

The centrifugal pump, delivering water to the sprays, is equipped with a double suction, one leading to the cold water supply and the other to a sump, into which the discharge from the spray nozzles drains, so that the cooling water may be recirculated. To manipulate these suction valves satisfactorily by hand, so as to maintain a uniform air temperature, requires frequent attention, and to overcome this a thermostatic control will be added to regulate the admission of cold water, by means of a mixing valve, to meet variations of incoming air temperature. It is also planned to install a thermostatic control to automatically start or stop the operation when the incoming air goes above or below the desired mine air temperature.

At another mine in Indiana a spray cooling system is now being installed, using the same type of nozzles used at both the Saxton Mine and Knox Consolidated Mine No. 2. This installation is being made on the surface just out by the air-intake drifts of the blowing fan, and is somewhat similar to the one at Saxton Mine except that because of a limited cold water supply, a double set of sprays is being installed, one set to cool the incoming air, and the other in a drift connected to the upcast compartment of the airshaft to recool the water for recirculation in the first set.

To cool the incoming mine air to a desired temperature by means of water sprays, it is obviously necessary that the temperature of the spray water be less than the desired intake air temperature, and since the cooling is accomplished by an exchange of heat between the air and the water, the lower the temperature of the water, the less water will be required.

The amount of cold water required to cool the intake air depends not only upon the temperature of the cooling water, but also on other variable factors, including the temperature of the intake air, the weight of the air, which also varies with the temperature, and upon the moisture content of the air.

Not only must the sensible heat in the air be considered, but also the latent heat of condensation or evaporation. If the incoming air is low in humidity, there will be evaporation at the sprays, with an absorption of heat, requiring less water, whereas, if the humidity is high, there is likely to be a condensation of moisture at the sprays, with an evolution of heat, requiring additional water.

For example, if the desired intake mine air temperature is 70° F. and is saturated with moisture when it leaves the sprays, it will contain 1.14 lbs. of water vapor per 1,000 cu. ft. at sea-level pressure. Incoming air at 100° F. and a relative humidity of 40 percent will contain the same weight of water per 1,000 cu. ft. If the degree of saturation, or relative humidity, is less than 40 percent, then evaporation will take place, and if above 40 percent there will be condensation. With the incoming air temperature at 100° F., there would be a condensation of .28 lb. of water with the evolution of 270 B. T. U. per 1,000 cu. ft. of air, to be taken up by the cooling water, for every 10 percent increase in humidity above 40 percent, and for every 10 percent decrease in humidity below 40 percent there would be an evaporation of .28 lb. of water, with the absorption of an equal amount of heat from the air. With cooling water at 58° F., the usual ground water temperature in the central field, it would require in the example just cited, $\frac{270}{12}$ or 22.5 lbs., or 2.7 gals. of water, to take care of the latent heat per 1,000 cu. ft. of air for each 10 percent of increase in humidity above 40 percent, in addition to the water required to take care of the sensible heat, and the same amount less for each 10 percent below 40 percent.

Taking the specific heat of dry air as .24 and also taking into consideration the weight of air and water vapor in 1,000 cu. ft. of air above 60° F., the usual coal mine strata temperature, an average approximate thermal equivalent of 1,000 cu. ft. of air is found to be about 18.6 lbs. or 2.24 gals. of water.

Since to cool the incoming mine air with water sprays there is merely an exchange of heat, to arrive at the number of gallons of cold water required to reduce the sensible heat in 1,000 cu. ft. of air at incoming temperature to the desired mine temperature, the thermal equivalent of 1,000 cu. ft. of air, 2.24 gals. of water, is multiplied by the difference between the incoming air temperature and the desired temperature, and divided by the difference between the desired mine air temperature and the temperature of the cooling water. This may be expressed by the formula

$$G = \frac{2.24\ (T^{2} - T)}{T - T^{1}}$$

in which

G = Gallons of cooling water required for 1,000 cu. ft. of air.
T = Temperature desired.
T^{1} = Temperature of cooling water.
T^{2} = Temperature of intake air.

An additional quantity of water is required to allow for the latent heat of condensation. This factor is extremely variable and during periods of high temperature and high relative humidity may exceed the quantity obtained from the above formula.

As the sprays cannot be expected to make a complete extraction of the heat if only the exact amount of water is circulated, it is desirable that a pump

and spray capacity of at least 1/3 greater than maximum cold water requirement be installed. The spray water recirculated to vary from full capacity of the pump to 1/3 capacity, depending upon the amount of cold water being admitted to the sprays automatically by thermostatic control.

Where large volumes of air are being passed into the mine, a considerable saving of power might be effected if a series of sprays were installed, each series to have its own pump which would be started automatically by a thermostatically controlled starter as the intake air temperature increased.

SOME GENERAL DATA ON AIR

1. At 32° F. approximately 12¼ cu. ft. of dry air weighs 1 lb. at atmospheric pressure.

2. Air expands about 1/490 of its bulk for each 1° F. rise in temperature. At 70° F. there are approximately 13 1/3 cu. ft. of dry air in 1 lb. at atmospheric pressure.

3. 1,000 cu. ft. of dry air at 32° F. weighs 81.566 lbs.; 1,000 cu. ft. of saturated air at 32° F. weighs 81.388 lbs.

4. Dry air is slightly heavier than water vapor by volume. A volume of dry air is therefore heavier than a volume of air containing water vapor.

5. Saturated air at 32° F. contains 1/160 of its weight in water.

6. The warmer air becomes the more moisture it will hold.

7. The amount of water saturated air will contain doubles for each 27° F. rise in temperature.

8. The specific heat of a substance is the quantity of heat (B. T. U. British Units), required to raise 1 lb. of the substance 1° F. compared to the quantity of heat required to raise 1 lb. of water 1° F.

The specific heat of air = .237.

9. The amount of heat required to raise the temperature of 1 lb. of water 1° F. one B. T. U., will therefore, raise the temperature 1/.237 lbs. of dry air 1° F. = 4.22. lbs.

At 70° F. 1lb. of air — 13 1/3 cu. ft. × 4.22 = 56.13 cu. ft. dry air will be raised 1° F. by one B. T. U.

10. As the specific heat of water is one or unity, and that of air .237, it will require more heat to raise the temperature of a given volume of air containing water vapor than the same volume of dry air.

Discussion

By H. F. HEBLEY†

MR. H. CONRAD has touched on a restricted application of "Air Conditioning" for coal mines in which the objective is to reduce the heavy roof falls in the air courses during the summer weather. For the most part this application has been made in the vicinity of Terre Haute, Ind., where shallow mines and spalling roof tendencies combine to cause trouble when the hot air of summer weather is pumped into the mine. In this district it is granted that a certain cooling effect will be experienced from the travel down the shaft; but that is not universally true.

Also the large quantity of water impounded in the sealed off portions of the mine, makes the cooling and saturation of the air a comparatively simple matter.

However, the installation of such a system is a distinct gain and the Knox Consolidated Coal Corporation are to be commended for their initiative.

In describing the calculations—I realize that most mining men think of ventilation in terms of air volume—that is in thousands of cubic feet per minute.

However, if one adopts weight—that is pounds per minute then the continued variation of volume with temperature and water vapor, can be avoided and the calculations simplified. For those who contemplate making these calculations I suggest they use Professor Goodenough's "Steam and Air Tables" especially those dealing with air and water vapor.

The larger application of "Air Conditioning," however, Mr. Conrad has not touched upon and these following remarks may be of interest to indicate how important is the subject.

For deep mines—both coal and metal, there comes a time when men cannot work in high temperature and high humidities. The work of Harrington—Haldane—Daly—Richardson, and others, has dealt with this phase of the subject.

At great depths where rock temperatures of 100° F. are encountered in the presence of quantities of water, the humidity may be so great that the miners' efficiency may be so low as to be unprofitable and it is possible that "heat stroke" may ensue unless some method of "Air Conditioning" is adopted.

In many places refrigeration units are installed, using brine as the cooling medium and blowing the air over the coils. Such systems are in use in Montana—South Africa—South America, and India.

The mine, Morro Vehlo, in South America, is the classic example; but a great deal of work has been done on this subject at the Anaconda Copper Company and also on the Rand in South Africa.

According to Dr. McConnel the known factors which affect a man in hot humid atmospheres are temperature—humidity and velocity of the air. The human body tries to maintain a proper thermal balance and increased temperature and moisture of the air will tend to prevent that balance from being maintained.

Heat is constantly being generated within one's body and dissipated at the surface by radiation—convection and evaporation.

If the air temperature equals the body temperature then radiation and convection cease and evaporation alone remains.

When the air temperature exceeds the body temperature then heat passes into the body.

It is stated that the limit of a man's ability to adjust himself to temperature conditions is approximately as follows:

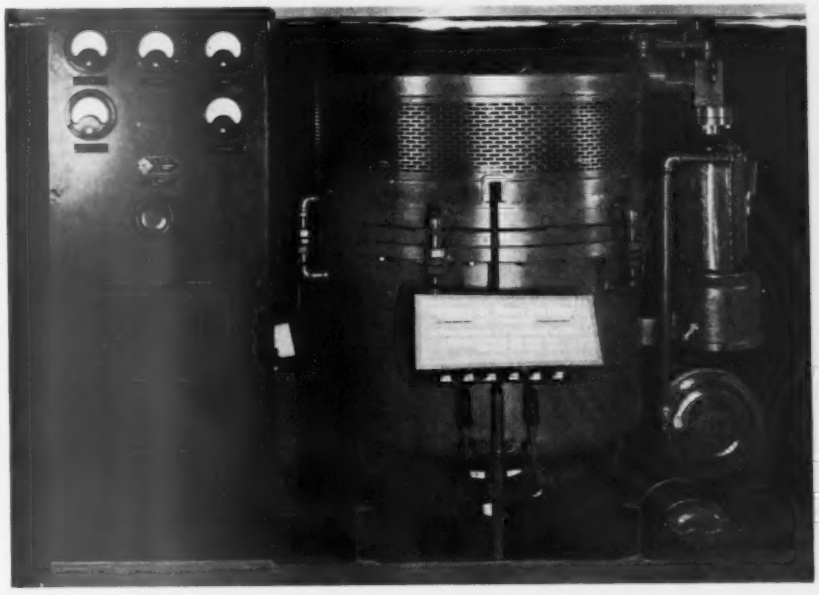
At rest in still air, 90° F., 100 percent relative humidity.

At rest, air traveling at 200 ft. per minute, 95° F., 100 percent relative humidity.

At work—in still air, 80° F., 100 percent relative humidity.

Of course, the manner in which a man is clothed has a great influence on his comfort and ability.

This type of problem presents some formidable difficulties but there have been some interesting solutions in various parts of the world and have been described in the technical literature.



This new Mercury-Arc Power Rectifier of the Allis-Chalmers Mfg. Co., exhibited in Coal Show at Cincinnati

† Engineer, Chicago, Ill.

TREATING COAL by the VIKING PROCESS at CASTLE GATE, UTAH

By MORONI HEINER *

THE Utah Fuel Company installed the Viking process at its Castle Gate Mine in April, 1935. Prior to that time there had been continuing complaints from domestic users about the amount of dust associated with the smaller sizes (particularly the sizes minus 1⅝ in.) of coal. It appeared imperative to remedy the trouble of excess dust for this was probably the greatest sales resistance to our smaller sizes. The prospective stoker owner always weighed this matter of dust as against the economy in fuel costs when considering the installation of automatic heating devices. Some stokers had been removed and gas or oil installed simply to escape the inevitable dust. The objections to dust with stoker fuel was particularly noticeable in smaller towns where handling coal was a part-time business to the dealer and the coal was generally delivered dry. Such places, too, were least accustomed to the generally dirtier atmosphere common to the larger cities. Our adoption of a satisfactory means of allaying the dust theretofore came as a natural development in making coal more satisfactory to the domestic trade.

Washing or dedusting by coal cleaning processes of the finer sizes of our coal had never been attempted for the reason that the coal does not increase appreciably in ash or sulphur content with decrease in size. Moreover, we had practically no combustion complaints due to fineness alone. The extremely dusty nature of the slack was the principal customer resistance. The oil vapor process as installed by the Viking Company seemed therefore the logical means of solving the problem.

The original installation contemplated treatment of screening only. The necessary equipment included the following:

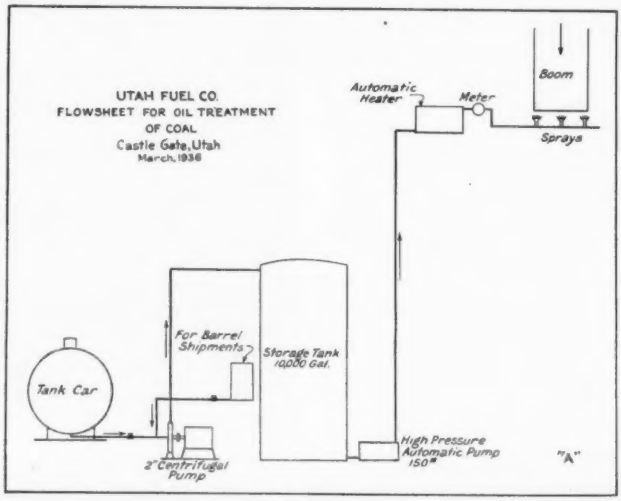
Oil storage tank.
High pressure pumping unit.
Heating unit.
Sprays.

These were installed in accordance with the flow sheet attached hereto (marked "A"). Provision was made for transferring the oil direct from tank cars to storage tank by the installation of a 2-in. centrifugal pump with flexible hosing attachment to the tank car. An auxiliary tank was installed for use in case the oil was received in barrels. This tank is located conveniently for truck and rail unloading. The barrels are emptied into the auxiliary tank and from there the oil is pumped to the storage tank.

The high pressure pumping unit is installed in a concrete housing adjoining the storage tank. The integral parts of this unit include: Screen, pump, pressure tank, by-pass and pressure valve. The oil is drawn through a screen for removal of impurities before entering the auxiliary pressure tank. A constant pressure (set at 120 lbs., adjustable to 150 lbs.) is maintained in this tank so the oil flow to heating units can be closely regulated.

The oil is pumped through a 1½-in. line to the heating unit which is located at the base of the screenings hopper shown by attached photograph. Here it is raised in temperature to 88° C. (190° F.) before going to the sprays. This heating element consists of an electrical coil inclosed within a cast housing. The flow of oil to the sprays can thus be closely controlled by valves as both temperature and pressure are maintained at practical constants.

From the heating unit ½-in. oil lines run to each set of sprays. The layout of nozzles for treatment of each size coal is shown by attached print "B." In the case of the hopper for 1-in. screenings the spray nozzles are spaced evenly around the telescoped throat opening. The coal drops through the mist of fine oil particles directly into gondola cars. To insure better penetration of the oil through the 1-in. screenings, a metal cone is placed in the telescoped throat opening of the screenings hopper to force the coal to spread in a thin layer



* President, Utah Fuel Co.

around the cone. Sizes other than 1-in. screenings are treated by spray nozzles installed at the end of the loading boom. (See "B" attached).

To obtain satisfactory results, it has been our experience that the following points should be watched closely:

1. A good grade of clean, well filtered oil should be used. Such oil should be entirely odorless. The heating, while partially offsetting differences in gravity in oils, should not eliminate the proper choice of the correct grade. We have found that an oil with the following specifications gives best results, including coverage and amount used:

Gravity—28°

Viscosity—100 at 100° F.

Flash point—about 275° F.

Cold test—zero deg. F.

2. The optimum amounts of oil for our plant and product are:

	Qts. per ton
1-in screenings	3.0
1⅝-in. screenings	2.5
1x1⅝-in. screened slack	2.0
1⅝x3-in. nut	1.5

Our experience shows that amounts of oil in excess of the above cause an oily sludge to form in the bottom of cars. Smaller amounts do not provide enough coverage to properly allay dust.

3. One man alone should be charged with the operation of the unit. Our experience shows that one man can handle it very well and this man will develop his own technique as to proper coverage and operation. Variations in the rate of oil flow have to be made by this operator to conform to different rates of coal discharge from booms and hoppers.

4. The temperature around the high pressure pumping unit should be maintained above the freezing point of water so that the oil will pass freely through the screen to the pressure tank. Lower temperatures cause the formation of sludge on the screen and the oil does not pump freely. To accomplish this result we have installed an ordinary radiant electric heater in the pump house.

We find that the oil treated coal offers the following advantages:

1. Coal is made "dustproof." This characteristic is practically permanent for ordinary use. Oil treated screenings will retain the oil for several months even though exposed to the weather. It is common for the dealer to hold storage piles throughout the summer with only slight loss of "dustproof" characteristic.

2. Other advantages include:

a. Oil treated coal produces a better clinker for domestic furnaces and less fly-ash. A common observation is that fly-ash is reduced 25 to 50 percent. The clinker appears to be more solid and therefore removal of ash is simplified.

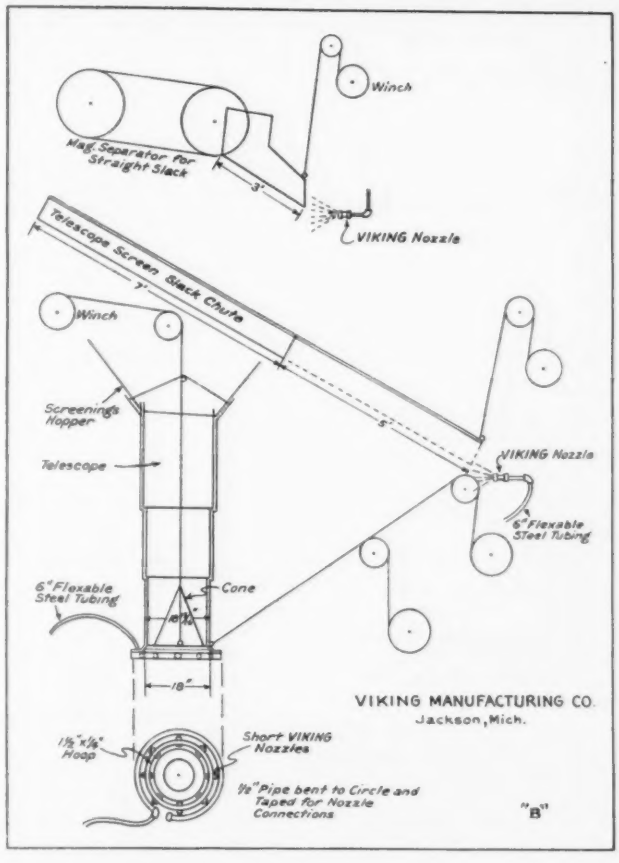
b. Oil treated coal acts as a preservative to metal surfaces such as railroad cars, retail yard equipment and stoker hoppers. The elimination of corrosive tendencies of the treating medium removes one of the greatest objections to coal spraying processes.

c. Less segregation. Fines tend to adhere to larger pieces and therefore handling in yards is simplified. Also stoker feed is more uniform. This in turn results in reduced packing tendency in stoker hoppers.

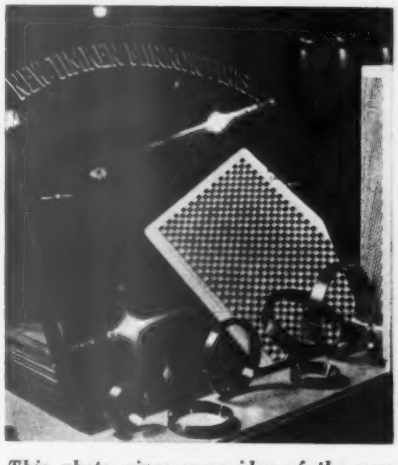
d. Somewhat lessened tendency to spontaneous combustion. Decreased segregation probably is the cause of this change.

Our experience shows that the domestic trade demands the oil treated coal to the exclusion of any substitutes. It is safe to say that practically 100 percent of the domestic users prefer this product. In addition, small commercial plants are now beginning to insist on the treated coal, solely as a means of eliminating dust. Industrial plants have not found the treated coal essential, probably because they have not been troubled with dust in their more isolated locations.

The wide acceptance by the trade of oil treated slack coal has led to the use of the process for treating screened slack—sized 1 in. x 1⅝ in. and of nut coal—sized 1⅝ in. x 3 in. These sizes require less oil due to their smaller surface areas and to the relatively small amount of extremely fine fly dust associated with them. While an increasing proportion of these sizes is being treated, the necessity of allaying dust here does not approach that with the slack coal. However, where their preparation does not accomplish the desired cleanliness the dust-proofing treatment is most valuable.



EXHIBITED AT CINCINNATI



This photo gives some idea of the new finish which is being placed on all Timken Bearings

Mechanization Trends

Reports of Coal Operators Committees

Methods for Determining the Effectiveness of Mine Fans

Report by the District Committee of Virginia

The mine is a drift operation with an average daily capacity of 2,000 tons. The ventilating system has two main inlets and one outlet; making two main splits coming to one fan. In one split the air travels a distance of 9 miles and in the other a distance of 7 miles. The intakes and outlet are at drift openings and are all practically the same elevation. The mine is classed as non-gaseous.

Equipment

The fan is a propeller type, 7 ft. in diameter, electrically driven by a 50 hp. motor at 2,200 volts a.c. The motor has manual control and starting resistance and is connected to the fan with a "cog belt"; reducing to a speed of 590 r.p.m. The fan is operated exhausting, delivering 63,260 cu. ft. of air per min. at a 2 in. water gauge.

Fan Test (made in August, 1935)

The instruments used in taking air readings were—anemometer, water gauge, and stop watch. Power readings on the motor were made with a watthour meter, 2 potential transformers at 20/1 ratio and 2 current transformers at 5/1 ratio.

Measurements of air velocity were made in the main air course 30 ft. inside the fan. Anemometer readings were taken for a period of 3 minutes at 36 points equally spaced on a cross section of the air course; holding the instrument at each point for 5 seconds. This action was repeated and the air velocity was taken as the average of the two figures. During these measurements, readings were taken on the water gauge, the speed of the fan, the speed of the motor and the watthours used in the motor circuit. No correction was made for natural ventilation as this factor is not noticeable.

The formulae used were as follows:

For calculating air volume delivered.

$Q = a\ v$ Where—

Q=volume of air in cubic feet per minute.

a=area of air course at point of velocity measurement less 2 square feet to allow for man's body taking readings.

v=average velocity of air in feet per minute.

For calculating horse power output of fan.

$$H.P. = \frac{Q \times g \times 5.2}{33{,}000}$$

Where g=water gauge in inches.

The power input to the motor was measured with a polyphase watthour meter connected in the motor circuit with current and potential transformers and counting the revolutions of disc per minute. The disc constant of the meter with instrument transformers was 4 kilowatts. The efficiency of motor was taken at the guarantee of the manufacturer. The efficiency of cog belt drive was taken as 97 percent.

Measurements Taken

R.P.M. of motor	864
R.P.M. of fan	590
Revolutions of watthour meter disc	7 in 58.3 seconds
Mine water gauge in inches	2
Average air velocity in ft. per min.	990
Net area of air course in sq. ft.	64

Results of Test

Volume of air in cu. ft. per min.	63,260.
H.P. output of fan in air	19.95
K.W. input to motor	28.80
H.P. input to motor	38.60
H.P. input at motor shaft	32.90
H.P. input at fan shaft	32.20
Overall efficiency of unit	51.60%
Efficiency of unit, allowing 97% drive efficiency and 85% motor efficiency	62.60%

Improvements and Cost Reduction

In the case of all ventilating units the criterion as to the mechanical efficiency is that guaranteed by the manufacturer for the conditions under which it is operating. Periodic tests are conducted to determine the degree with which the fan fits the mine it is serving. When results of tests vary to any noticeable extent the cause is localized as attributable to fan or mine and the necessary changes to correct any adverse results are made if practicable and economical.

In line with this practice, the unit described in this report was installed following a test of an old steam driven centrifugal fan which was too large and did not fit the mine. Comparative ventilation costs at this mine before and after the change were:

Monthly total operating cost of old unit	$ 557.72
Monthly total operating cost of new unit	217.60
Monthly total saving in operating costs	$ 340.12
Approximate investment for improvement	$1,500.00

Submitted by

J. J. SELLERS,

District Committee of Virginia

Report by the District Committee of Wyoming

Anemometer Readings—Careful analysis of velocities made by velometer reading in 20 positions across airway. Average velocity taken as *Sum of all Reading ÷ 20.* Check readings were taken with anemometer, which showed average V. used in test computation to be reasonably correct.

Water Gauge Readings—Water gauge is shown continuously on fan chart. Check readings taken on standard "U" tube throughout test.

Fan Readings—Velocity and pressure readings are taken 9 ft. inbye fan throat. The discharge of fan is analyzed for reentry and uniform travel by air by means of velometer. This data not used in calculating fan efficiency.

Natural Ventilation — Measured as 15,000 cu. ft. at time of test. No deductions were made for natural ventilation.

Formulae Used—Area of fan drift=90 sq. ft. Average velocity as determined by combination of anemometer and velometer=2,030 ft. per minute. Water gauge=1.2 in.

Form 1—$A \times V = Q$.

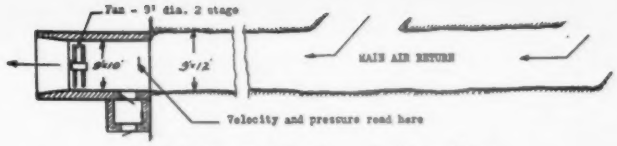
$90 \times 2{,}030 = 182{,}700$ cu. ft. per min.

Form 2—$\frac{W.G. \times 5.2 \times Q}{33{,}000}$ =H.P. on air.

$\frac{1.2 \times 5.2 \times 182{,}700}{33{,}000} = 34.54.$

Actual K.W. input=33.34 at .80 Power factor $\frac{33.34 \times 1{,}000}{746}$ =44.7 H.P. motor input.

$\frac{34.54}{44.7}$ =77.2 Percent Efficiency



Sketch showing location of air readings

Power Measurements—Voltage, amperes and power factor are measured by standard instruments. Watts are recorded by portable wattmeter. No allowance made for mechanical efficiency of motor or belt drive. R.p.m. of fan and motor checked to determine slip of belt but not taken into consideration in calculations. This test was made to determine the ratio of electric power used to actual power on air and did not consider the efficiency of the various moving units.

Fan Efficiency—Each fan is studied to determine its best efficiency under its normal operating conditions and tests are made when conditions change. These tests usually indicate when airways need enlarging, also when a fan should be moved to a new location. These tests also permit an intelligent decision to be made in the case of replacing an old fan with one of newer design. No efficiency rating can be made to cover all fans, for each fan has its own particular defects. Each fan can be tested, however, to determine its efficiency under normal operating conditions and these conditions can be kept to standard or a fan can be selected to suit the changed conditions.

Ventilation Improvements—Every fan test made results in some improvement to ventilation and great savings in power consumption have been made by carefully following up tests and enlarging air courses or moving fans from a mine not suited to their characteristics.

Submitted by
G. B. PRYDE, *Chairman.*

Chairmen of the Coal Operators Committees Meet at Cincinnati

DURING the week of the Cincinnati convention the National Project Committee held a series of conferences to formulate plans for their reports. During the past six months the District Committees have been exceedingly active and have submitted 41 reports containing data, descriptions and other valuable information on the various operations of coal mining. This information is to be the basis for the National Project Reports.

On Wednesday, May 13, a luncheon meeting was held by the chairmen of the District and Project Committees, where future plans were discussed and adopted. This meeting was attended by the following:

I. N. Bayless, Union Pacific Coal Co.

W. J. Borries, Dawson Daylight Coal Co.

J. D. Conover, American Mining Congress.

William Crichton, Jr., Johnstown Coal & Coke Co.

C. W. Gibbs, Harwick Coal & Coke Co.

T. W. Guy, consulting engineer, Charleston, W. Va.

M. W. Horgan, Monongahela West Penn Public Service Co.

H. B. Husband, Chesapeake & Ohio Fuel Mines.

A. R. Joyce, Wood Preserving Corp.

Carl Lee, Peabody Coal Company.

T. F. McCarthy, Clearfield Bituminous Coal Corp.

R. H. Morris, Gauley Mountain Coal Co.

C. B. Officer, Sullivan Machinery Co.

R. G. Pfahler, Berwind-White Coal Mining Co.

J. H. Richards, Hanna Coal Company.

Bruce G. Shotton, Hendrick Manufacturing Co.

E. A. Siemon, Hillman Coal & Coke Co.

F. G. Smith, Poston Consolidated Coal Co.

G. B. Southward, American Mining Congress.

T. J. Thomas, Valier Coal Company.

H. A. Treadwell, C. W. & F. Coal Co.

D. D. Wilcox, Superior Coal Company.

The meeting was opened by Julian D. Conover, Secretary of the American Mining Congress, who, in complimenting the group on the work which they had accomplished, said in part:

"The American Mining Congress is very much interested in the work you gentlemen are doing. We regard it as a very important part of our activities and we consider the Mining Congress fortunate in having your services on these committees. The objective of this whole movement is to pool our information concerning successful mining practices and to develop increased efficiency, lower costs and a better product. The importance of this work to the coal mining industry can hardly be over emphasized.

"I want to express our appreciation of the individual efforts of the committee members in preparing these reports. We realize that much of this work has to be done in your extra time and we hope you feel, as we do, that this time is well spent. Fifteen District Committees and ten National Project Committees are now organized and functioning, and the 41 reports already submitted make an extremely creditable showing. It has taken some time to get this work under way, but we believe that the movement will go ahead like a snowball and that each year will see continually greater progress and additional accomplishment."

Mr. T. J. Thomas, president of the Valier Coal Company, also complimented the group on their constructive work in behalf of the coal industry.

In introducing the subjects for discussion, G. B. Southward, mining engineer for the American Mining Congress, submitted his annual report on the committee progress over the past year, from which the following is quoted:

"The purpose of the Operators Committees is to show the representative best practices used in the operations of coal mining. It is not our plan to make recommendations, but rather to find out what factors are involved in selecting the equipment and in determining the operating practices that are successfully used under different mining conditions.

"In carrying out this plan it was decided that our program should consist of two parts. First, the District Committees were to prepare a series of reports on mining operations practiced in their fields. Second, the National Project Committees, using the District Reports as a basis, were to make resumes or studies that would bring out the pertinent facts.

"The organization of the District Committees was completed during the summer of 1935 and since that time 41 reports have been submitted. A number of additional reports are in the Washington office and will soon be sent out.

"We are now starting the second phase of our program and the Project Committees are preparing the plans for their National Project Reports. It is expected that rapid progress will be made on these during the coming summer and some should be ready for release by early fall."

COAL INDUSTRY MEETS AT CINCINNATI

THE groups affiliated with the thirteenth annual coal mining convention and exposition of The American Mining Congress, in arranging the 1936 meeting, set out to surpass all previous records and hang up new records for future meetings to shoot at. That they succeeded far beyond even their enthusiastic ambitions, is evidenced by the records attained at the convention and exposition held at Cincinnati, Ohio, May 11 to 15, inclusive, 1936. The program was of the finest order, and was presented with efficiency; the attendance broke all previous records, with a registration of approximately 4,000 persons; the exposition was the largest and the finest ever presented; the entertainment features were unusual and attended by a majority of the delegates. Every activity was well organized and moved forward with a maximum of efficiency. It was a splendid meeting, offering to all who participated worthwhile information.

The convention opened officially on Monday, May 11. On Sunday afternoon, May 10, R. E. Salvati, general manager, Island Creek Coal Company, and chairman of the Program Committee, gave a get-together party in the Presidential Suite, Netherland Plaza Hotel, for members of his committee and the Board of Governors of the Manufacturers' Section. This offered an excellent opportunity for all of those cooperating in the development of the meeting to become acquainted and to start the convention off with enthusiasm. This event was attended by all members of the committees, the local Cincinnati group serving as hosts to the convention, and by officials of the American Mining Congress.

A. E. Bendelari, president, The Eagle-Picher Lead Company, and a director of the Congress, again served as the city's official host. Mrs. A. E. Bendelari again offered to the delegates a sample of that hospitality that characterizes the Southland.

A new high in convention entertainment was achieved. Among the delightful features offered were Miss Cornelia Otis Skinner, the famous original Old Heidelberg Octette, and Ward Wilson, NBC premier imitator. The entertainment features were under the direction of W. D. Turnbull, Westinghouse Electric & Manufacturing Company, and a committee composed of L. Russell Kelce, Hume-Sinclair Coal Mining Co.; J. R. Ulrich, Bethlehem Steel Co.; H. H. Taylor, Jr., Franklin County Coal Corporation; R. J. Ireland, Jr., Owl Creek Coal Co.; H. C. Stelling, Union Carbide & Carbon Corporation; H. B. Husband, Fuel Mines of Chesapeake & Ohio Railway Company; C. P. Daniel, Enterprise Wheel & Car Corporation; C. E. Hough, Koppers Coal Co.; A. S. Knoizen, Joy Manufacturing Company; and A. R. Joyce, Wood Preserving Corporation.

All sessions of the convention were well attended, the average audience being more than 500 persons. To W. W. Dartnell, of the Valley Camp Coal Company, and his committee, M. D. Cooper, Hillman Coal & Coke Co.; C. W. Connor, Nellis Coal Corp.; F. F. Jorgensen, Consolidation Coal Co.; and M. R. Budd, Hercules Powder Co., go the wholehearted thanks of the industry for their efficient and business-like manner of handling the sessions of the convention. Mr. Dartnell, as chairman of the Floor Committee, undertook to present each session in the time allotted to it, and to have each paper presented in a scheduled time. The result was a smooth-running convention program. There was no lagging, and all speakers cooperated with the committee to the fullest degree.

The convention was opened Monday morning, May 11, by Julian D. Conover, secretary, the American Mining Congress. Mr. Conover spoke briefly of the development of the coal mining industry during the thirteen years in which these conventions and expositions have been held. He said that observers of the industry had commented upon its

Annual Banquet of the Coal Convention

Reamy Joyce, Toastmaster

extraordinary progress in adopting modern mining methods and thus obtaining lower costs and a better product. He said that the American Mining Congress is gratified to have had a part in this movement and that its services, both in the development of these conventions and in the year-round work of its Coal Operators Committees, would continue to be devoted to advancing the best interests of the mining industry.

As chairman of the Monday morning session, Mr. Conover then introduced I. N. Bayless, Assistant General Manager of the Union Pacific Coal Company, Rock Springs, Wyoming.

E. J. Newbaker, national chairman of the Coal Division of The American Mining Congress, who has contributed so generously of his time and ability to the upbuilding of these conventions and expositions, said:

"I believe it was 13 years ago that the first Congress opened here. I have attended every one. For myself and my organization, I think we learned a great deal. Without this Congress or without this meeting in Cincinnati with its exposition on the part of the manufacturers, I believe that the coal industry would be in a very much more serious condition than it is today. You know, we have been told that we are a dying industry. I wish the man who made that remark would come into this hall today and see these operating men here and see this exhibit. I think he would change his mind.

"We admit that we have been in a bit of a slump, but is there any other material, organic or inorganic, in this world that has all of the things necessary for human progress, for civilization as a whole? I think the answer to that is, No. In my opinion, this slump in the industry, since its high peak of 10 or 12 years ago, has been a good thing. It has stimulated all of us to produce coal more cheaply because of competition, and it also has stimulated research to discover what is in coal in order to meet the competition of other forms of fuel and energy.

"I wish to congratulate the manufacturers and express the thanks of the operating men of the coal industry for what they have done for us in these past 13 years; also to express to The American Mining Congress the deep sense of gratitude for the wise leadership that they have given us."

R. E. Salvati, as chairman of the program committee, deserves the great credit which is his for the development of this splendid meeting. He gave days of his time, much of his remarkable organizing ability, and great enthusiasm to this meeting. In speaking at the opening session, Mr. Salvati said:

"I personally feel the time has now come when the coal industry is going forward. I believe that this year is going to mean better progress in the coal industry than any other time heretofore. I think more companies are going into mechanization and preparing their coal better than at any other time. Competition is such that the industry realizes that in order to put out a product that is 100 percent we must prepare our coal. We used to feel if we had a two- or three-track tipple making two or three grades and hand-picking that coal, that we were more or less up-to-date. Gentlemen, I stand here and say that those days are going and going fast. I really believe—and our company feels so—that in order to stay in the business today you have to better prepare your coal than at any other time.

"In view of my opinion of what this industry is going to be, the progress this industry is going to make in the next two or three years, this American Mining Congress meeting here, the thirteenth annual meeting, is one of the best that this Congress has ever had.

"The manufacturers have done everything in their power to present their product so that operators will be better able to select products, select machinery, to fit their needs. I know of no better place than here to see this machinery in working order. I know of no better place for you gentlemen, the operating men of today, to meet each other and see this equipment.

"In view of this convention, in our opinion, being the best, we have tried to arrange a program that will be interesting to all the operating men of today.

The Wednesday Morning Session

"I want to pay particular tribute to the district chairmen and members of our program committee. They have worked hard. They worked diligently. They have tried to select men of the industry today to give you papers, to give you operating ideas, a knowledge of what the industry is doing, and what the future holds for this industry. We have tried to select men who will give you a story that will be interesting to you as well as educational."

C. B. Officer, vice president, Sullivan Machinery Co., and chairman of the Manufacturers' Section which sponsored the exposition, together with the 47 member companies of the Section, did outstanding work in organizing and presenting the equipment for the attention of the operators. In acknowledging introduction at the opening session, Mr. Officer said:

"The Manufacturers' Section wishes to express, through me, their sincere appreciation to the program committee of the Coal Division, and particularly Mr. Salvati, for the splendid program of interesting topics which they have suggested for discussion at this convention. The broadness of the scope and interest of topics on vital problems of the coal industry together with the selection of the authors have been a very deciding factor in assuring greater attendance at this year's meeting. Today we hear numerous talks that coal is not of as prime importance in the development of heat, energy and power as it formerly was, that gas, oil, hydraulic energy are making rapid strides forward and inroads into the domain of coal.

"We all recognize that the problems of mining, merchandising, cleaning and sizing of coal are more complicated and difficult today than they were 10, 20 or 30 years ago. The whole problem of distributing the energy that coal may produce is a new chapter which is just beginning: that is, should we transport coal itself only a short distance to convert its energy there into a form of power that is more easily and economically transmitted to the point of application? The fact that these problems are more complicated really adds more zest and interest to the entire subject.

"The number of manufacturers who will exhibit at this convention and the variety of new and interesting developments to be seen, plus the fact that more manufacturers have taken more space this year than ever before in the history of The American Mining Congress is a testimony to the coal industry that we manufacturers of coal mining equipment had hope, belief and faith that the coal industry will maintain its position of leadership in this field of heat, energy and power.

"I wish to take this opportunity to thank the manufacturers who are exhibiting, the members of the Board of Governors of the Manufacturers' Section, and particularly Mr. Shugg, director of exhibits; Mr. Turnbull, chairman of the entertainment committee, and, most particularly, Mrs. Coombes, for the splendid help, enthusiasm and cooperation which they have given in making this year's exhibit what I believe will be the most outstanding one in the history of The American Mining Congress."

Of special interest to those attending the convention was the presence of J. F. Callbreath, Secretary Emeritus of The American Mining Congress, and for many years actively in charge of its work. Mr. Callbreath had been absent from the previous convention by reason of ill health, and his many friends were rejoiced to see him fully recovered. Mr. Callbreath was introduced at the Monday morning session, and spoke eloquently of the forward-looking spirit of the coal industry in meeting its problems.

The program occupied four full days. It presented 81 main papers, and 86 persons participated. Among the interesting features of the program was a motion picture presented by the Bell & Zoller Coal & Mining Company, "The Story of a Famous Coal," which depicted the entire operation of that company's properties at Zeigler, Ill. These properties are completely mechanized, and the company has recently put into operation the largest coal cleaning plant in the country. The picture begins with the man-trip and the unique safety broadcasting system in operating underground, and ends with a trip through the new cleaning plant and the loading of the coal into railroad cars ready for shipment to the consumer.

J. D. Rogers, vice president, Stonega Coke & Coal Company, presided at the afternoon session, May 11.

The entire Monday program follows:

Coal Production Methods — Today and Tomorrow.

Paul Weir, vice president, Bell & Zoller Coal & Mining Co.

Progress of Mechanical Loading and Conveyor Mining, Including Mining Conditions and Factors Affecting Development.

T. F. McCarthy, general superintendent, Clearfield Bituminous Coal Corporation. (New conveying units installed; no radical changes in mining methods during 1935; mechanically loading rock in entry development.)

John H. Richards, mining engineer, Hanna Coal Co. of Ohio.

Thomas Murphy, superintendent of mines, Northwestern Improvement Co. (Substituting undercutting machines

and conveyors for hand contract mining, marked operating economies have been obtained.)

C. F. Hamilton, vice president, Binkley Coal Co. (Developments and improvements made in haulage by motor trucks from pit to tipple in open-pit mines during the past year. New problems in this method of transportation.)

H. B. Husband, general manager, Fuel Mines, Chesapeake & Ohio Railway Co. (Recent installations of mechanical loaders and conveyors will increase the amount of mechanized coal in West Virginia.)

James White, superintendent, Mine No. 48, Peabody Coal Co. (Mechanization started in 1920. Mechanically loaded tonnage increased 150 percent in Indiana from 1929 to 1935; and nearly 100 percent in Illinois.)

Coal Cleaning Plant, Northwestern Improvement Co.

E. R. McMillan, mining engineer, Northwestern Improvement Co. (A combination water and air coal cleaning plant; describes the unique automatic mechanisms used, and results accomplished.)

Modern Production Methods and the Future of Coal.

Eugene McAuliffe, president, Union Pacific Coal Co.

New Things in Mine Safety.

LOCOMOTIVES PAINTED WITH ALUMINUM AND HAVING REFLEX MIRRORS.

J. V. Berry, Industrial Collieries Corp. (Signs and signals can be seen and read for great distances. A protection to men while working on haulways and for machine crews.)

BROADCASTING SAFETY MESSAGES UNDERGROUND.

John Lyons, safety engineer, Bell & Zoller Coal & Mining Co. (A program of recordings and short safety talks given over loudspeakers during the daily broadcast, heard by the miners in the washhouse and in the man-trips.)

BONUS PAYMENTS.

Eugene McAuliffe, president, Union Pacific Coal Co. (Since the bonus plan was established in 1930, a total of $128,282.95 has been paid to employes. Program directed toward the general upbuilding of the force.)

Ernest Todd, chief clerk, Bell & Zoller Coal & Mining Co. (Bonuses paid to foremen based on savings in the cost per man-hour of exposure; cash prizes in mines with no lost-time accident in 2,500-man shifts.)

Hitch Drill Practice.

Frank M. Schull, general superintendent, Binkley Mining Co. (Drill holes for the placement of mine timbers much safer and more economical than formerly secured by various methods.)

Portable Mine Car Compressor.

F. C. Carothers, general superintendent, Pond Creek Pocahontas Co. (The rotary compressor is a radical departure in mine compressors. Adapting to mobile equipment. Performance justifies a broader use in the industry.)

Effect of Wide Places on Roof.

O. B. Pryor, general superintendent, Elm Grove Mining Co. (A change to wide entries has completely revolutionized roof conditions. A practice contrary to previous methods proved very successful.)

DISCUSSION:

Alexander Jack, Pennsylvania Coal & Coke Co. (Effect of "caving chambers.")

Harry M. Moses, general superintendent, United States Coal & Coke Co., presided at the Tuesday morning session, and H. C. Faust, general manager, United Pocahontas Fuel Co., presided at the afternoon session. The following papers were presented:

Our Modern Coal Industry.

C. F. Hamilton, vice president, Binkley Coal Co.

New Things in Coal Cleaning.

A. E. Roberts, chief engineer, Heisley Coal Co. (Some of the problems arising through the use of air; proposed solutions with principles involved; experimental work projected with a view to a more satisfactory solution with results to date favorable and unfavorable.)

W. J. Skewes, mechanical engineer, Pocahontas Fuel Co., Inc. (A few of the new things in coal cleaning observed in the Pocahontas Coal Field.)

R. H. Sherwood, president, Central Indiana Coal Co. (An English vacuum flotation process for cleaning up sludge or slurry cheaply.)

Palmer C. Saricks, vice president, Wolf Collieries Co. (Plan differs somewhat from standard type of breaker.)

E. J. Weimer, general manager, Snow Hill Coal Corp. (Cleaning of coal up to 6 inches; automatic controller regulating the refuse.)

J. B. Morrow, preparation manager, Pittsburgh Coal Co.

R. J. Weimer, Northern Illinois Coal Corp.

W. E. Wolfe, supervisor, Clinchfield Coal Corp. (Problems encountered from face to railroad car.)

Trip Dispatching and Car Movement Records.

R. G. Lazzell, operating superintendent, Island Creek Coal Co. (A few general rules on trip dispatching and a description of haulage system.)

DISCUSSION:

Wm. J. Wolf, division manager, Consolidation Coal Co.

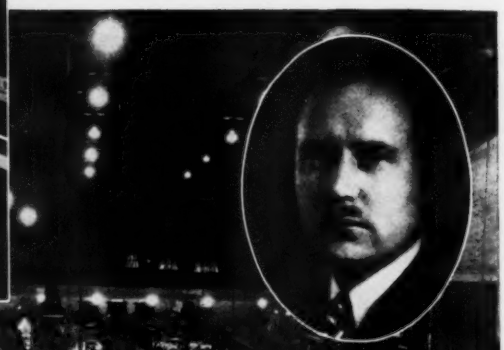
Power Plant Operation.

R. H. Sherwood, president, Central Indiana Coal Co., and president, Antioch Power Co. (Description of power plant built for strip pit and mechanized shaft mine.)

Directors' Luncheon

NORTH HALL EXHIBITS

Insert: C. B. Officer, Chairman, Manufacturers Division, 1935-1936



Rock Tunneling with Shaking Conveyors

M. A. Sharp, foreman, Union Pacific Coal Co. (Method of shooting and loading, cost of explosives and time required to drive.)

Treatment of Tunnel Driving, Anthracite Field.

B. L. Lubelsky, explosives engineer and tunnel superintendent, Philadelphia & Reading Coal & Iron Co. (A description of operation, equipment and organization Driving costs given.)

Cutting Bit Treatment.

N. A. Elmslie, division superintendent, Industrial Collieries Corp. (Experiments with high grade steels, patented bit points and tipping with hard alloys. Bit cost may be important in power consumption and cutting efficiency.)

E. H. Jenks, mining engineer, Rochester & Pittsburgh Coal Co. (Outline of experiments leading to the adoption of tipped bits. Methods of bit treatment and results.)

H. E. Schweinsberg, production engineer, The Valley Camp Coal Co. (In cutting the Pittsburgh No. 8 seam, the use of special tipped bits has eliminated many difficulties encountered with untipped bits.)

D. D. Wilcox, general superintendent, Superior Coal Co. (Properly forged and shaped treated bits are necessary to add efficiency to the cutting machine operation.)

James Hyslop, chief engineer, Walter Bledsoe & Co. (Types of bits discussed, and effect of various cutting conditions on bit performance.)

Power Efficiencies.

C. H. Matthews, E. E., Susquehanna Collieries Co. (Improved power factor reduces cost, increases capacity and improves efficiency of generators, transformers and power lines.)

The Economics of AC-DC Conversion.

W. A. Buchanan, district manager, Appalachian Electric Power Co. (Comparative initial investment of various standard sizes of motor generator sets, rotary convertors, and mercury arc rectifiers. Data show the over-all efficiency of these three types of conversion equipment and their relative losses when applied to mine loads. Data obtained from actual accounting records showing maintenance costs.)

Coal Bumps Under Heavy Cover.

John F. Daniel, Kentucky Department of Mines. (The origin of coal bumps is discussed and recommendation for the prevention of coal bumps in the future is given.)

Aero Mechanics as Applied to Mine Ventilation and Fans.

A. Lee Barrett, Pittsburgh Coal Co. (Research for aviation has determined new laws governing the flow of air. These are applied to improve mine ventilation.)

Chairmen for the Wednesday sessions were H. L. Griffin, division engineer, Koppers Coal Company, and W. L. Affelder, vice president, Hillman Coal & Coke Co. Mr. Affelder was unable to be present, and C. W. Gibbs, of the Harwick Coal & Coke Co., presided at the afternoon session. The following papers were presented:

Progress in Related Fields of Industry.

L. E. Young, vice president, Pittsburgh Coal Co.

Accident Records: Comparison and Causes of Accidents Over Five-Year Period.

W. W. Adams, United States Bureau of Mines. (The coal-mining industry, 1930-1934, progressed in accident prevention.)

DISCUSSION:

N. P. Rhinehart, West Virginia Department of Mines.

James McSherry, Illinois Department of Mines. (Illinois' coal mine accident record compares favorably with those of other large producing states.)

M. J. Grogan, Lynch Coal Operators Association.

Wm. Richards, safety engineer, Madeira, Hill & Co. (In Anthracite mines the hazard is not increased by mechanical loading.)

W. J. Stiteler, Jr., Coal Operators Casualty Co. (Commendable safety records are the result of efficient leadership.)

Thos. P. Kearns, Industrial Commission of Ohio.

J. F. Bryson, safety director, Harlan County Operators Association.

Rock Dusting.

P. H. Burnell, superintendent, Owl

SOUTH HALL EXHIBITS

Insert: Bruce G. Shotton, Chairman, Manufacturers Division, 1936-1937

Creek Coal Co. (Sprinkling recommended to remove dust from air that may be harmful to health but is not effective in preventing explosions.)

Increasing Efficiency in Transportation.

Joseph Anstead, electrical engineer, Templeton Coal Co. (Each phase is a problem to be thoroughly analyzed and given close supervision.)

DISCUSSION:

Lee Haskins, superintendent, Bell & Zoller C. & M. Co. (Adequate side tracks, trip dispatching and signaling essential. Mechanical loading increases gathering problems.)

Employes' Safety Meetings—Open and Closed.

Chas. W. Connor, superintendent of mines, Nellis Coal Corp. (The open meeting is more effective in educating the community but the closed meeting is preferred in securing the interest and cooperation of the employe.)

J. B. Benson, Koppers Coal Co.

G. A. Roos, assistant general manager, P. & R. Coal & Iron Co. (Plan of Safety Committee Organization in the collieries of the Philadelphia and Reading Coal and Iron Company.)

Cutting Out Impurities in Coal Seam.

W. D. Northover, preparation engineer, Rochester & Pittsburgh Coal Co. (Cutting out impurities with the mining machine produces a better face preparation; less burdensome on the miner and increases his earning power.)

Prospecting For Coal With Diamond Drills.

C. E. Swann, chief engineer, Union Pacific Coal Co. (Size of diamond drills used in prospecting, method of preparation for a drilling campaign. Several uses for diamond drill holes.)

Coal Cleaning at the Peabody Coal Company.

Jack R. Verhoeff, construction engineer, Peabody Coal Co. (A plant designed primarily to recover coal and pyrite from picking table refuse. May also be used for washing screenings.)

Relation Between Life of Entry and Type of Track Equipment.

Geo. E. Bayles, chief engineer, Ohio & Pennsylvania Coal Co. (Three types of haulage are discussed—gathering, intermediate, and main line.)

Paul Halbersleben, general superintendent, Sahara Coal Co. (Stresses importance of surveys. Straight haulways and regular curves reduce maintenance costs and also permit safer operation at higher speeds.)

General Use of Power and Energy at the Mine.

C. C. Knipmeyer, construction engineer, and head, electrical engineering department, Rose Polytechnic Institute. (Outlines study of power costs at a coal mine with special reference to ventilation, cutting, hoisting, haulage, pumping, tipple and transmission.

Peter F. Loftus, consulting engineer, and K. A. Spencer, vice president, Pittsburg & Midway Coal Mining Co., presided at the Thursday sessions, when the following papers were presented:

Modern Mining Methods and Coal's Future.

P. C. Thomas, vice president, Koppers Coal Co.

High Production in Cutting Machine Efficiencies.

David Ingle, Jr., superintendent, Buckskin Coal Corp. (Wide working places and long cutting bars reduce costs by increasing the tonnage. Supervision and clean track are essential.)

Thos. L. Garwood, engineer, New Orient Mine, Chicago, Wilmington & Franklin Coal Co. (The conveying machinery about the preparation plant embraces most all types with the exception of screw and vibrating conveyors.)

Conveyor Mining.

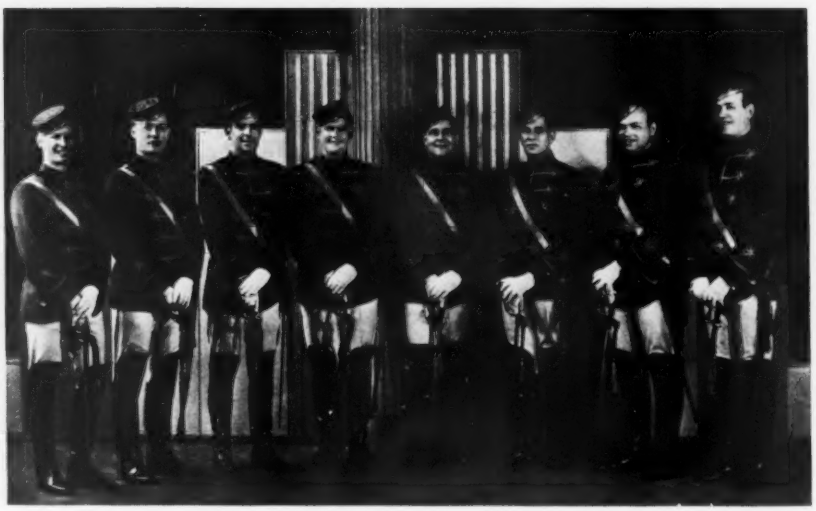
H. E. Willson, chief engineer, Laurel Creek Coal Co. (The history of a period of experimentation at one low coal mine in the New River field of West Virginia.)

Thos. F. Steele, general manager, Penn Anthracite Collieries Co. (Anthracite operation where mine cars are eliminated and all underground transportation is by conveyor.)

Features of the Entertainment Provided For the Delegates to the 13th Annual Coal Convention

MISS CORNELIA OTIS SKINNER,

Famous star of stage and radio, who presented a group of her original character sketches.



THE ORIGINAL OLD HEIDELBERG OCTETTE,
Musical group who won international fame at "A Century of Progress."

WARD WILSON,
Radio's Premier Mimic

RAINBOW BREAKFAST

An honorary breakfast tendered to R. E. Salvati, and attended by eighty-six of his fellow operators.

E. A. Siemon, division general superintendent, Hillman Coal & Coke Co. (Describes results of 10 years' experience in a mine now using 37 conveyor units for entries, rooms, and pillars.)

New Designs in Car Construction.

DEVELOPMENT OF MINE CARS OVER EIGHT-YEAR PERIOD AT KOPPERS COAL CO.

F. S. Follansbee, chief engineer, Koppers Coal Co. (Large capacity cars reduce cost in hand loading and mechanical loading. Construction features embodied in recent car design.)

REDUCING COSTS WITH MODERN PIT CARS.

C. J. Sandoe, vice president, Perry Coal Co.

R. E. Hobart, mechanical engineer, Lehigh Navigation Coal Co. (Improvements in design for mine cars used in the southern anthracite field where pitching seams require different service than flat seams.)

ESSENTIALS IN MINE CAR DESIGN.

A. R. Long, superintendent, New River Co. (Capacity of car important in reducing haulage costs. Flexibility prevents derailments and reduces wear.)

Mechanical Loading System.

T. J. Thomas, president, Valier Coal Co. (Mechanization being forced by increased cost of production with hand methods.)

Air Conditioning.

H. G. Conrad, general superintendent, Knox Consolidated Coal Corp. (A newer application is described which is for the purpose of checking the damaging effect of summer weather on mine roof.)

Haulage Practice.

H. W. Saunders, chief engineer, American Coal Co. of Allegany County. (Finding out the correct form of haulage system by making a projection several years ahead; costs and data on mule haulage and on gathering motor haulage.)

Walter Buss, mining engineer, Knox Consolidated Coal Corp. (Portable mechanical loaders and haulage methods are, more or less, typical of mines in Indiana and Illinois.)

Trackless Mining.

O. S. Batten, mining engineer, Utilities Elkhorn Coal Co. (Loading machines load directly onto conveyors which discharge to a main conveyor running to the tipple. Seam has height of from 36 to 50 inches. Belt conveyor used for main haulage and chain conveyor at the working faces.)

Welded Rail Joints For Mine Tracks.

G. Stuart Jenkins, general superintendent, Consolidated Coal Co.

DISCUSSION:

Irvin C. Spotti, mine foreman, Hanna Coal Co.

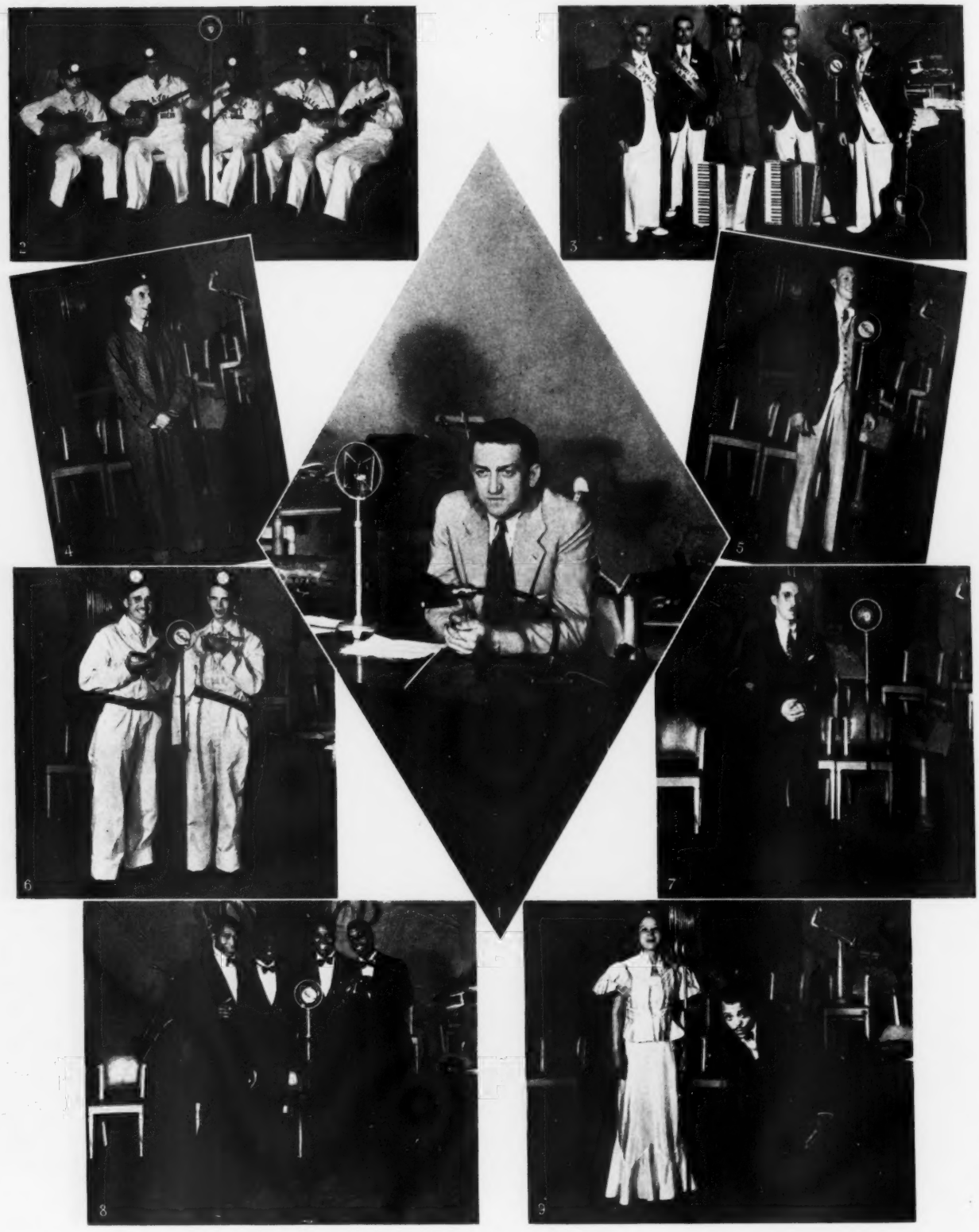
The Friday morning session was devoted to the inspection of exhibits. There was no convention session. The exhibits were kept open for the convenience of those operators who had not had sufficient time to give the exhibits thorough inspection, and a considerable number took advantage of the opportunity. More than 100 operators registered on Friday morning.

The entire convention and exposition moved forward from Monday morning to Friday noon with ever-increasing momentum, and a tired but happy group closed the doors at 1 p. m., Friday, upon what everyone insisted was the finest and most important convention and exposition ever given for the coal industry.

W. P. Vance, general superintendent, Butler Consolidated Coal Co., and Geo. R. Delamater, assistant vice president, The W. S. Tyler Co., were chairmen of the attendance committee. They attempted to set a record, and succeeded, with a total registration of 3,889 persons.

E. B. Agee, of the Youngstown Mines Corporation, and John T. Ryan, of The Mine Safety Appliances Company, had their hands full in welcoming the delegates. Mr. Agee and Mr. Ryan were assisted by a large committee of operators and manufacturers and endeavored to see that no delegate arrived who was not properly welcomed, and no delegate departed without the feeling that the committee was delighted to have had him present.

Among the outstanding things arranged by the entertainment committee was the "Miners' National Amateur Contest," which attained nation-wide attention. The purpose of the contest was to determine the best available talent in the coal fields. Many coal companies participated, holding local elimination contests at each mine and final contests from among the winners of the local try-



1—"Major" William D. Turnbull, who turned in a remarkable performance as master of ceremonies and leader and sponsor for the amateur contest; 2—Hickory's Old Timers, Belt & Zoller Coal Co.; 3—Musical Quartet, Koppers Coal Co.; 4—Soloist, Crescent Mining Co.; 5—Soloist, Hanna Coal Co.; 6—Harmonica Duo, Butler Consolidated Coal Co.; 7—Soloist, Pittsburgh Coal Co.; 8—Quartet, Island Creek Coal Co.; and 9—Singing and Dance Team, Valley Camp Coal Co.

Miners' National Amateur Contest Winners

First Prize:
Bell & Zoller Coal Co.'s "Hickory's Old Timers." Hill-Billy Band.

HICKORY'S OLD TIMERS

Second Prize:
William J. Williams, Baritone, Crescent Mining Co.

WILLIAM J. WILLIAMS

Third Prize:
Dancing and Singing Act—Presented by Valley Camp Coal Co.

Mr. and Mrs. Reed
SINGING & DANCING

outs. Ten companies participated in the national finals at Cincinnati, with the Bell & Zoller Coal Company's "Hickory's Old Timers" walking off with the first prize—$50 in cash and an opportunity to be heard over NBC's Red Network. The contest turned out to be a truly worthwhile event. Companies participating were: Bell & Zoller Coal Co., Crescent Mining Co., The Valley Camp Coal Mining Co., Koppers Coal Co., Hanna Coal Co., Butler Consolidated Coal Co., Island Creek Coal Co., and Pittsburgh Coal Co. First place was won by the Bell & Zoller Coal Co.; second place by the Crescent Mining Co., whose entry was Wm. J. Williams, a baritone soloist of unusual merit. Third place was won by the Valley Camp Coal Co., whose entry was a colored couple in a novelty singing and dancing act. After winning third place, Valley Camp's entry appeared as guest artists at Cincinnati's Cotton Club.

A feature of the Amateur Contest was the Chiselberg Brothers, played by Ray and George Arms, the former of Roberts & Schaefer Company, and the latter of Jeffrey Manufacturing Co. They represented the Snowbird Mines, of Chiselberg—and got the gong!

Real talent was developed by each entry. It was difficult for the judges to choose between them. Judges were: Jackson Murray, manager and member of the Old Heidelberg Octette; Thomas J. Martin, National Orchestras Bureau, furnishing entertainment for the entire chain of hotels under the National Hotel Company Management; F. W. Voynow, production manager, WLW Radio Station, Cincinnati; and the audience.

An amateur of unusual merit, and a close runner-up for first prize, was Paul Taylor, entry of the Hanna Coal Company, who won his place after severe competition from others in the Hanna organization. Mr. Taylor's excellent tenor voice was given an audition at WLW, Crosley Radio Station, and we anticipate that the industry will hear further from him. Another runner-up with excellent possibilities was the entry of the Pittsburgh Coal Company, a baritone soloist, who magnificently presented "On the Road to Mandalay." The Kopper Coal Company's entry of a musical group deserve most honorable mention, as well as the colored quartette of Island Creek. The harmonica players of Butler Consolidated Coal Company were excellent. In fact, every act was outstanding, and the only regret was that they all could not have won.

Mere words cannot adequately express the excellent performance of W. D. Turnbull, who out-majored Major Bowes. His clever handling of the entire amateur program was outstanding, original and pleasing.

The winners of the contest—Bell & Zoller's "Old Timers"—presented three numbers in hill-billy style: "Chicken Reel," "When It's Night Time in Nevada," and "Coming Round the Mountain." These numbers also were presented over the National Broadcasting Company's Red Network, originating with Station WSAI, Cincinnati, and picked up and relayed by WEAF, New York City. This broadcast was arranged by Miss Frances Rockefeller King, Artists Bureau, National Broadcasting Company, and was participated in by Ward Wilson, the Old Heidelberg Octette, who sang "Take Me Back to My Boots and Saddle" and Brahm's "Lullaby," R. E. Salvati, Julian D. Conover, and, of course, the winning amateurs. Mr. Conover, as secretary of The American Mining Congress, said:

"This meeting represents one of the

great basic industries of our modern civilization. The mining industries of this country employ more than 1,500,000 workers, and furnish a livelihood, directly or indirectly, for fully 25,000,000 people. Coal, alone, furnishes the basis for more than 500 major industries, and gives to the world its cheapest known power."

Mr. Salvati followed, saying:

"The coal industry employs thousands of workers, pays wages and taxes, and otherwise contributes toward everyday comfort and national progress. This coal convention and exposition has been attended by operators from all parts of the United States. Modern machinery used in the production of coal has been shown, and topics of interest in the production of coal have been discussed. Here for four days these many operators have congregated at this convention to discuss ways and means of achieving greater efficiency and safety in the mining of the national coal supply."

The annual dinner set a new record for convention dinners, which are frequently tiresome. For several years this meeting has specialized in the "Speechless" variety and has won wide acclaim. Approximately 800 delegates attended the dinner. The entertainment began with introduction of a distinguished head table, including leading coal mining officials, and distinguished artists, and ended with the awarding of prizes to the winner of the prize contest which has become a regular part of this convention. Reamy Joyce, Wood Preserving Corporation, served with distinction as toastmaster. Guest artists at the dinner were Miss Cornelia Otis Skinner, famous star of stage and radio, who gave a number of her original sketches; the Old Heidelberg Octette, one of the finest musical organizations in the country; Ward Wilson, who gave impersonations of Graham McNamee, President Roosevelt, Al Smith and Amos and Andy; and finally, but by no means least, the beautiful Kelly-Bahlke Dancers in the Dream Girl Waltz.

On Wednesday morning of the convention a special breakfast was given in honor of R. E. Salvati as chairman of the Program Committee. This affair was in the nature of a "Rainbow Breakfast" and was beautifully arranged. Eighty-five of his fellow-operators paid tribute to Mr. Salvati, and W. J. German of the Pocahontas Fuel Company presided as toastmaster.

One of the happiest entertainment features was the Old Heidelberg group, who were guests of the convention from Monday to Friday. This group, with their beautiful voices, their colorful uniforms, their military precision and deportment, were both eye and ear filling, and added to the pleasure of every delegate.

A novel form of entertainment was introduced on Wednesday evening, May 13, when the "Spring Meeting of the American Mining Congress Jockey Club" was held, in the Pavillon Caprice of the Netherland Plaza Hotel. Eighteen famous coals—represented by 18 lovely girls dressed as jockeys—participated in the races, in which the jockeys moved forward on a giant checker-board according to the throw of huge dice. The companies participating were: Youghiogheny & Ohio Coal Co., Butler Consolidated Coal Co., Philadelphia & Reading Coal and Iron Co., Consolidated Coal Co., Valley Camp Coal Co., Binkley Coal Co., Cleveland-Cliffs Iron Co., Carnegie Coal Co., Hume-Sinclair Coal Mng. Co., Centralia Coal Company, Old Ben Coal Corp., Lorain Coal & Dock Company,

View of the exhibit of the Jeffrey Manufacturing Company

Booth of the United States Steel Corporation

Exhibit of the Sullivan Machinery Company, winner of the 1936 *Honor Trophy*

Pond Creek Pocahontas Company, Dawson-Daylight Coal Co., Pittsburg & Midway Coal & Mining Co., Koppers Coal Co., Franklin County Coal Company, and the Monroe Coal Mining Co.

The first race, the "Futurity," was won by Betty Lou, entered by the Philadelphia & Reading Coal & Iron Company, at odds of 9 to 1. The second race, the "Kentucky Derby, Jr.," was captured by the Lorain Coal & Dock Company's entry, June, paying 5 to 1. Bettie, entry of the Koppers Coal Company, was the winner of the third race, the "Hollywood Special," with odds of 6 to 1. The fourth race was the "A. M. C. Handicap," being run by the winners of the three preceding races to determine the final All-Event winner. This feature race was won by June, entry of the Lorain Coal & Dock Company, paying odds of 2 to 1.

Racing officials were W. D. Turnbull, steward; H. B. Husband and C. P. Daniel, associate stewards; H. C. Stelling, timer; L. Russell Kelce, custodian of Jockeys' Room; H. H. Taylor, Jr., H. C. Stelling, and C. P. Daniel, mutual managers; and Ray Ulrich, groom.

A national publicity committee was appointed by Mr. Salvati early in January, and actively promoted the development of the convention and exposition. This group was headed by A. Broggini of the National Carbon Company, who had cooperating with him H. J. Saladin, Standard Oil Co.; W. W. Rodgers, Westinghouse Electric & Manufacturing Co.; Louis J. Ott, Ohio Brass Co.; Karl H. Runkle, General Electric Co.; and M. H. McWilliams, Hanna Coal Company. David Russell Coombes handled the general work of the committee. Mr. Coombes is affiliated with the General Electric Company through its subsidiary, the National Electrical Supply Company.

Each year a feature of the convention is the Annual Prize Contest. This year the contest was under the direction of E. C. Reither of the Timken Roller Bearing Company. Prizes are awarded (1) the operators who fill in the card by visiting each exhibit, and (2) the manufacturer who receives the largest vote for the best exhibit. Prizes are awarded operators by drawing names from the ballot box at the annual dinner. This year's winners were: first prize, G. E. radio, went to L. D. Siniff, Rochester & Pittsburgh Coal Co., Indiana, Pa.; second prize, a complete fishing tackle set, John S. McGhee, Island Creek Coal Co., Whitmans, W. Va.; and third prize, a hostess set, including electric toaster, service tray and stand, William McDonald, Valley Camp Coal Co., Wheeling, W. Va.

The annual meeting of the Manufacturers' Section of The American Mining Congress was held on Tuesday morning, May 12. This group sponsors the exposition, which is such an important part of the convention. This year C. B. Officer, Sullivan Machinery Company, served as national chairman, and the results obtained under this leadership set a record that coming committees will have difficulty in surpassing. For the first time in the 13 years' history of the meetings, there was a capacity exhibit. Approximately 52,000 sq. ft. of floor space was utilized. North and south wings of Music Hall were filled to capacity, and the second floor of south wing was utilized by 22 exhibits. The meeting room for convention sessions was on the second floor, as well as the restaurant. In all, 137 machinery and supply houses were represented. Exhibits were colorful and presented artistically. It is difficult to present mining machinery artistically, but the photographs appearing in this issue seem to show that this group succeeded.

The award for the best exhibit went to the Sullivan Machinery Company. This company had an outstanding exhibit, and estimated the value of the machines on the floor of their space at more than $200,000. Other exhibits that were unusual and outstanding were the Jeffrey Manufacturing Company, the United States Steel Corporation, the Joy Manufacturing Company, Goodman Manufacturing Company, Timken Roller Bearing Company, General Electric Company, John A. Roebling's Sons Company, Ohio Brass Company, and the Westinghouse Electric & Manufacturing Company.

Above—Exhibits on second floor of Music Hall

Below—The Lobby and Registration Desk

More than 100 absolutely new things were presented.

At the annual meeting of the board the following officers were elected for 1936-37: Bruce Shotton, Hendrick Manufacturing Co., chairman; Wm. E. Goodman, Goodman Manufacturing Co., first vice chairman; R. L. Cox, Jeffrey Manufacturing Co., second vice chairman; and Frank E. Mueller, Roberts & Schaefer Company, third vice chairman.

L. W. Shugg lived up to his industry-wide reputation as the country's leading exposition director. Each year the General Electric Company permits Mr. Shugg to take sufficient time from his duties to direct the installation and maintenance of exhibits for this convention, and each year, as his duties increase, he performs with increasing efficiency. This year, in addition to serving as guest director of exhibits, he assumed responsibilty as coordinator for the ambitious entertainment program, which probably accounts for the excellent manner in which all of these events were presented.

Howard I. Young, president, The American Mining Congress, and Mrs. Young were guests of the convention throughout the week.

A meeting of the National Board of Directors of the Mining Congress was held on Thursday noon, May 14, to which leading executives of coal companies, in addition to the mining men from various branches of the industry who serve on the Board, were invited. Those present were: R. C. Allen, vice president, Oglebay, Norton & Company and president, Lake Superior Iron Ore Association; W. E. Barrow, president, Joy Manufacturing Company; Henry S. Beal, president, Sullivan Machinery Company; A. E. Bendelari, president, The Eagle-Picher Lead Company; Donald A. Callahan, president, Callahan Zinc-Lead Company; Erle V. Daveler, treasurer, Utah Copper Company and Nevada Consolidated Copper Corporation; T. B. Davis, chairman of board, and J. D. Francis, president, Island Creek Coal Company; Andrew Fletcher, vice president, St.

Joseph Lead Company; Charles F. Hamilton, vice president, Binkley Coal Company; George B. Harrington, president, Chicago, Wilmington & Franklin Coal Company; E. P. Humphrey, assistant to president, and J. D. Rogers, vice president, Stonega Coke and Coal Company; W. J. Jenkins, president, The Consolidated Coal Company; T. R. Johns, general manager, Industrial Collieries Corporation; David D. Moffat, vice president, Utah Copper Company; E. J. Newbaker, vice president, The Berwind-White Coal Mining Company; Robert S. Palmer, secretary, Colorado Chapter, American Mining Congress; F. S. Pfahler, president, Superior Coal Company; John B. Putnam, of Andrews Hadden & Putnam; Herbert Wilson Smith, Union Carbide & Carbon Corporation; R. J. Smith, president, Princeton Mining Company; L. N. Thomas, vice president, Carbon Fuel Sales Company; Howard I. Young, president, American Zinc, Lead and Smelting Company, and president of the American Mining Congress; Julian D. Conover, secretary of the American Mining Congress; J. F. Callbreath, secretary emeritus, and A. W. Dickinson, of the Mining Congress staff.

Mr. Young presided and called for reports on the various activities of the organization. Following a summary by Mr. Conover of the legislative situation in Washington, with particular reference to those bills in which the mining industry is directly interested, all present participated in an interesting and constructive discussion. Reports of special interest were submitted by Mr. Daveler, chairman of the Finance and Budget Committee, and by Mr. Putnam, chairman of the Legislative Committee. In the absence of H. B. Fernald, chairman of the Executive Tax Committee, a summary of developments in the Revenue Law of 1936 was given by Mr. Conover.

Display of the Joy Manufacturing Company

Exhibitors at the convention were:

Ahlberg Bearing Co.
Air Reduction Sales Co.
Allen-Sherman-Hoff Co.
Allis-Chalmers Mfg. Co.
American Brattice Cloth Co.
American Cable Co.
American Car & Foundry Co.
American Sheet & Tin Plate Co.
American Steel & Wire Co.
Anaconda Wire & Cable Co.
Atlas Powder Co.
Austin-Western Road Machinery Co.
Automatic Reclosing Circuit Breaker Co.
Bethlehem Steel Co.
Bowdil Company, The.
Broderick & Bascom Rope Co.
Brown-Fayro Co.
Bucyrus-Erie Co.
Carnegie-Illinois Steel Corp.
Chicago Pneumatic Tool Co.
Cincinnati Mine Machinery Co.
Coal Mine Equipment Sales Co.
Columbia Alkali Corp.
Cavett Company, L. P.
Deister Concentrator Co.
Differential Steel Car Co.
Dorr Company, The.
Duff-Norton Manufacturing Co.
Duncan Fdry. & Machine Works.
Du Pont de Nemours & Co., E. I.
Edison Storage Battery Co.
Electric Railway Equipment Co.
Electric Railway Improvement Co.
Electric Storage Battery Co.
Enterprise Wheel & Car Co.
Fafnir Bearing Co.
Fairbanks, Morse & Co.
Flood City Brass & Electric Co.
General Electric Co.
General Explosives Division of The American Cyanamid & Chemical Corp.
Goodman Manufacturing Co.
Gould Storage Battery Corp.
Grasselli Chemical Co.
Gulf Refining Co.
Hendrick Manufacturing Co.
Hockensmith Wheel & Mine Car Co.
Hercules Powder Co.
Hulburt Oil & Grease Co.
Irwin Foundry & Mine Car Co.
Jeffrey Manufacturing Co.
Joyce Cridland Co.
Joy Manufacturing Co.

Goodman Manufacturing Company

Kanawha Manufacturing Co.
Keystone Lubricating Co.
Koppel Industrial Car & Equipment Co.
Koppers Rheolaveur Co.
LaBour Company, Inc.
La-Del Conveyor & Mfg. Co.
Lehigh Safety Shoe Co.
Leschen & Sons Rope Co., A.
Link-Belt Co.
Macwhyte Co.
Mancha Storage Battery Locomotive Co.
Marion Steam Shovel Co.
Marlin Rockwell Corp.
McGraw-Hill Publishing Co.
McNally-Pittsburgh Manufacturing Co.
Metal & Thermit Corp.
W. H. Miner, Inc.
Mine Safety Appliances Co.
Mining Congress Journal.
Morrow Manufacturing Co.
Morris Machine Works.
Mosebach Electric & Supply Co.
Myers-Whaley Co.
National Carbon Co.
National Electric Coil Co.
National Malleable & Steel Castings Co.
National Tube Co.
New Departure Manufacturing Co.
Nordberg Manufacturing Co.
Norma-Hoffmann Bearings Corp.
Ohio Brass Co.
Penn Machine Co.
Penna. Electrical Repair Co.
Phillips Mine & Mill Supply Co.
Portable Lamp & Equipment Co.
Post Glover Electric Co.
Princeton Foundry & Supply Co.
Prox Company, Frank.
Pure Carbon Co.
Pure Oil Co.
Republic Steel Corp.
Roberts & Schaefer Co.
Robins Conveying Belt Co.
Robinson Ventilating Co.
Roebling's Sons Co., John A.
Ryerson & Son, Inc., Jos. T.
Safety First Supply Co.
Safety Mining Co.
St. Louis Power Shovel Co.
Sanford-Day Iron Works, Inc.
Scully Steel Products Co.
Simplex Wire & Cable Co.
S K F Industries, Inc.
Socony Vacuum Oil Co.
Solvay Sales Corp.
Standard Oil Co. of Indiana.
Stephens Adamson Mfg. Co.
Sullivan Machinery Co.
Sun Oil Co.
Templeton Kenly & Co.
Texas Co.
Tide Water Oil Co.
Timken Roller Bearing Co.
Tool Steel Gear & Pinion Co.
Tracy Co., Bertrand P.
Tyler Co., The W. S.
Tyson Roller Bearing Co.
Universal Lubricating Co.
Utility Mine Equipment Co.
United States Bureau of Mines.
Viking Manufacturing Co.
Watt Car & Wheel Co.
Weir Kilby Corp.
Western Cartridge Co.
Westinghouse Elec. & Mfg. Co.
West Virginia Rail Co.
Williamsport Wire Rope Co.
Wood Preserving Corp.

—Courtesy General Electric.

L. W. SHUGG
Director of Exhibits

The Mining Congress Journal at Cincinnati

Each year has seen an increasing number of wives of delegates attending the convention. This year the number practically doubled previous years' records. On the opening day Mrs. Conover was hostess at a delightful luncheon for the ladies. Mrs. A. E. Bendelari and Mrs. Charles L. Harrison, of Cincinnati, entertained them on succeeding days, with tea at Mrs. Harrison's lovely Grandin Road Home, and luncheon at the Fox and Crow Club. Cincinnati is to be congratulated upon having the cooperation of such charming and public-spirited ladies as Mrs. Harrison and Mrs. Bendelari.

E. R. Coombes, assistant to the secretary of the American Mining Congress, handled the many arrangements for the convention and exposition with customary skill and efficiency.

In spite of the wear and tear of a week's convention, delegates departed homeward reluctantly. The vote was unanimous as to the complete success of every feature of the meeting.

News and Views

of Interest to Mining Men

● IDAHO MINING ASSOCIATION, Boise, Idaho, recently issued a statement upon matters directly affecting the mining industry in Idaho, as follows:

No. I.—The future of mining in the State of Idaho will be greatly hampered by excessive and unfair methods of taxation imposed upon the industry. There is no natural resource which requires greater investment or more diligent or laborious effort in its development than does mining. Consequently the reward, if the enterprise is successful, must be larger than in other industries to warrant such expenditures of time, effort and money. To impose burdensome taxes upon successful enterprises of this character is to seriously interfere with and discourage future efforts to bring to light this always hidden resource. The mining industry should not be singled out for special taxation.

No. II.—We urge that in appropriations for highways made by the Federal Government provision should be made for the building of mine to market roads to reach sections of mining territory which are now practically inaccessible. There are large areas of promising but undeveloped mining territory in the state of Idaho which cannot be successfully explored because of the lack of transportation facilities, and the cost of building highways in such regions is beyond the ability of local and state governments. If appropriations are to be made for highway purposes, either as part of a scheme of internal development or for the purpose of furnishing work relief, the building of mine to market roads furnishes the best opportunity for a return in added wealth and increased employment.

No. III.—We urge upon our representatives in Congress that in the matter of new revenue legislation they use the utmost diligence in protecting the interests of corporations engaged in mining in Idaho. The recommendations of the subcommittee of the Ways and Means Committee, if carried out, would impose such a burden upon corporations engaged in developing mining properties as would seriously cripple the industry in our state. This is particularly true of those corporations which are endeavoring to pay for properties and erect reduction plants and other improvements through the proceeds derived from the properties themselves. Practically all mining properties in Idaho have been developed in this manner. To impose the maximum tax or the so called "relief" rates provided in the bill upon earnings which are devoted to payments for properties and for capital improvements would be most destructive. In the same connection we strongly urge the repeal of the capital stock and excess profits tax, particularly because the fair application of the law to the mining industry is almost impossible unless provision be made for periodical revision of the declared value.

No. IV.—We are of the opinion that the Securities Law of 1933, as amended, and as administered under the rules and regulations of the Securities and Exchange Commission, has hampered and retarded the financing of mining corporations and the development of potential mining resources. The business of mining is different from that carried on by any other industrial corporation. The financing of mining corporations depends upon different factors than does that of any other class. Accordingly we urge upon the Securities and Exchange Commission an amendment of their rules and regulations relative to registration of the securities of mining corporations to the end that worthwhile enterprises may not be prevented from selling securities because of hard and fast rules applicable particularly to other classes of business. We believe that two requirements are necessary only: That limitations should be placed upon the amounts allocated to those concerned with the promotion of mining corporations and that funds realized from the sale of mining securities should be devoted principally to the actual development of mining prospects. We particularly protest an amendment of the rules of the Securities and Exchange Commission which would exempt certain mining issues from registrations, upon the registering of such securities with the proper agencies in states where such securities are to be sold. We believe that this plan is not practical because of the trouble and expense involved and we favor rather a simplification of registration along the lines above suggested.

No. V.—We urge that in the location of forest development roads, and forest highways by the forest service, the dual purpose of serving mining areas and forest purposes be taken into account and wherever possible such forest roads be made also usable as mine to market highways. We particularly call attention to the feasibility of applying this rule to the proposed road, starting at Red River ranger station on Red River and extending to the Salmon River, so as to serve the Dixie Mining district in Idaho County, and the improvement and new construction of the forest service road from Cascade to Artillery Dome and Stibnite in Valley County.

THE LAST OF A LONG LINE

—The Washington Post

● A STUDENT of the copper industry points out that it has been over developed in the United States. If so, it was not noticeable until many low cost mines of large reserves were developed abroad, and cut down the exports of the metal from this country. It suggests the question of how many undeveloped copper properties there are in the United States. There is one large undeveloped porphyry at Morenci, Ariz., owned by Phelps Dodge Corp., and if there are other important and proven wholly undeveloped mines the fact is not generally known. There are, however, numerous possible extensions of copper deposits in developed districts. Viewed from world-wide angle, the copper industry is being handled admirably. The great surplus of metal has been reduced to about normal, just at a time when consumption is increasing. Producers throughout the world will be prepared to enjoy reasonable profits, which is as it should be in all divisions of the mining industry. Position of copper is the best in over five years. (Skilling's Review.)

● THE OUTPUT of rolled zinc (sheet zinc, boiler plate and strip zinc) in the United States in 1935 was 56,541 tons, valued at $8,774,000 and represented the highest production recorded since 1929. Production in 1934 was 40,916 tons valued at $6,201,000. Thus, the production was 38 percent higher and the value 41 percent higher in 1935 than in 1934. In addition to the quantities given, scrap strip and ribbon zinc originating in fabricating plants operated in conjunction with zinc-rolling mills was rerolled, and production therefrom amounted to 13,551 tons in 1935, and 9,333 tons in 1934.

● SALES OF ZINC OXIDE by producers in the United States amounted to 99,697 short tons valued at $10,237,953

in 1935 compared with 87,088 tons valued at $9,851,421 in 1934, representing increases of 14 percent in quantity and 4 percent in value. Sales of leaded zinc oxide amounted to 29,976 tons valued at $2,791,808 compared with 20,506 tons valued at $2,018,935 in 1934, representing increases of 46 percent in quantity and 38 percent in value. The volume of sales of zinc oxide was the largest recorded since 1930 and that of leaded zinc oxide was the largest since 1925.

Distribution of sales of zinc oxide and leaded zinc oxide by uses in 1934 and 1935 is shown below:

Sales of zinc oxide and leaded zinc oxide, by uses, 1934-35

Zinc oxide	1934	1935
Rubber	50,145	57,734
Paints	23,741	25,289
Floor coverings and textiles	4,781	7,179
Ceramics	2,963	4,028
Other	5,458	5,467
Total	87,088	99,697
Leaded zinc oxide		
Paints	20,376	29,632
Rubber	28	36
Other	102	308
Total	20,506	29,976

Imports of zinc oxide (dry) for consumption in the United States in 1935 totaled 1,931 short tons and of zinc oxide in oil 59 tons compared with 1,204 and 64 tons, respectively, in 1934. Exports of zinc oxide were 1,140 short tons in 1935 compared with 1,155 tons in 1934.

● A CERTIFICATE of honor was presented to Ellsworth No. 51 Mine of Industrial Collieries Corporation by the U. S. Bureau of Mines at a general safety meeting held at Ellsworth, Pa., May 21.

J. P. McCune, superintendent of the Ellsworth division, presided over the meeting, and J. J. Forbes, supervising engineer of the Instruction Section at the Pittsburgh station of the U. S. Bureau of Mines, spoke on mine safety after making the award.

The certificate is the fourth consecutive one of its kind to be awarded to No. 51 Mine since 1932, and is based on a cumulative safety-performance of nearly six years, from July 21, 1930, to January 1, 1936, during which time the mine operated without a fatality.

The certificate was awarded by the Joseph A. Holmes Safety Association at its annual meeting at Washington, D. C. March 5.

● COPPER STATISTICS for April reflected marked improvement in the industry, showing a decrease of 12,200 tons of world stocks and an increase of 3,200 tons in domestic consumption. Reports indicate that domestic consumption close to 60,000 tons represent a new high for any month in several years, while the world consumption was the largest since last November.

● THE LAKE SUPERIOR IRON ORE ASSOCIATION reported early in May that stocks of ore on Lake Erie docks and in furnace yards totalled 22,933,433 gross tons which compares with approximately 27,000,000 gross tons on a similar date of 1935.

● THE OLIVER MINING COMPANY of Duluth will ship from 16 mines and groups of mines during the season of navigation which recently opened. This company is the largest individual shipper of iron ore from the Lake Superior region, shipping 10,362,895 gross tons in the 1935 season.

● THE MERRITT-CHAPMAN AND SCOTT CORPORATION of New York has been awarded the contract for the construction of the new continuous steel sheet and strip mill at Pittsburgh for the Jones and Laughlin Steel Corporation. Equipment for the mill will be furnished by the Mesta Machine Company and the General Electric Company.

● THE UNITED STATES PATENT OFFICE recently granted two patents on Anthracite burning equipment developed by the Anthracite Institute Laboratory at Primos, Pa. One patent covers a furnace operating on a new principle of combustion, by which all waste space over the fire bed is eliminated. As a result the unit is more compact than the conventional type of boiler, which makes it particularly adaptable for domestic heating purposes. Its design also permits its operation for comparatively long periods without attention.

The second patent covers a mechanical stoker and ash conveyor, designed to take coal directly from the storage bin, burn it in an improved fire pot, and remove the ashes to any convenient spot, even outside the house if desired.

In designing these units the object was to make them simple and compact, and to permit their manufacture at an attractive cost figure. As manufacturing arrangements have not yet been completed the new apparatus has not been put on the market.

● MINES of the Cœur d'Alenes, which paid dividends last year of $2,500,704, have already increased their dividend rates this year to figures which will bring the total dividends of the district in 1936 to $4,571,499, if the present dividend rates are sustained through the year. These rates, it may reasonably be said, are more apt to be increased during the year, than decreased.

Sunshine Mining Company began 1935 with quarterly dividends of 20 cents a share. Before the year was over, it was paying 50 cents a share, and it has paid two quarterly dividends this year of 50 cents a share per quarter. At this rate, it will pay $2,977,644 this year, compared with $2,074,349 last year.

The Bunker Hill resumed dividend payments last year on its common stock, after a lapse of five years, and paid dividends on its common and preferred stock of $226,355. At the rate it is now paying, it will pay this year $1,034,855.

Hecla Mining Company resumed dividends in August last year, and in the year it paid $200,000. It raised its dividend rate in April, and is now paying at a rate which will make a total for the year of $550,000.

● THE QUANTITY of magnesium ingot sold or used in 1935 was 4,241,218 pounds, nearly reaching the record figure of 1934 (4,249,838 pounds). The entire domestic output of primary magnesium was obtained from magnesium chloride recovered as a joint product of the salt wells of The Dow Chemical Company near Midland, Mich.

The following table shows

SPEAKING OF CIRCUSES

—The Washington Post

the total quantity and value, and average price per pound, of domestic magnesium ingot produced and sold or used by the producer, 1931-1935.

New Magnesium Ingot and Stick Produced in the United States and Sold or Used by the Producer, 1931-1935.

Year	Pounds	Value	
		Total	Average price per-pound [1]
1931	580,463	$199,633	$0.34
1932	791,699	228,653	.29
1933	1,434,893	377,181	.28
1934	4,249,838	[2]	.26
1935	4,241,218	[2]	.30

[1] Represents average of total sales for 1931 and 1932; sales for domestic consumption only, 1933 and 1934; and nominal price per pound in carload lots for 1935.
[2] Bureau of Mines not at liberty to publish figures.

● FOUR big mines of the Cœur d'Alenes earned profits in 1935 of $5,040,898, according to official reports which the companies under the Idaho law are required to file with the county assessor. This compares with $2,940,983 in 1934 and $1,783,030 in 1933.

Sunshine has become the most profitable and the heaviest producer. In the year its profits amounted to $2,937,340. It extracted 160,417 tons of ore, valued at $4,135,297, at an extraction cost of $560,893; it paid $272,063 for freight and treatment and $365,000 for betterments.

The Bunker Hill Mine extracted 353,259 tons of ore, valued at $4,101,859, at an extraction cost of $1,430,881. It paid $2,093,386 for freight and treatment and $57,513 for improvements.

Profits of the Hecla Mining Company in the year netted $808,487. It extracted 245,635 tons at a cost for extraction of $815,851. Its freight and treatment amounted to $616,803. The gross value of its output was $2,250,520.

The Federal Mining and Smelting Company reported an output from its Morning Mine of 298,568 tons, with a gross value of $3,413,994. Its cost of extraction was $1,641,714; freight and treatment, $1,282,720; and expenditures for betterments, $12,891, leaving a net profit of $476,668.

Besides this, the Federal made a net profit of $133,427 from its Page Mine, and $15,160 from its Frisco Mine. The Bunker Hill made a profit of $99,740 from its Crescent Mine. It is estimated that at least $50,000 of profits was made from leases in the district. This brings the total profits for the Cœur d'Alenes to $5,040,898. None of the "Day" properties were producers during the year. The Golconda reported a net loss of $22,138 during the year.

● THE COLLEGE OF ENGINEERING, University of Illinois, will give a short course in coal utilization, June 9, 10 and 11, 1936. In their announcement they give as the purpose of this course the following: "To present an educational program of technical and practical information pertaining to coal and its efficient utilization for the benefit of those engaged in mining, preparing, marketing and using coal, as well as those manufacturing and distributing machinery for the preparation and utilization of coal."

Six sessions will be held and the following topics will be discussed:

The Transportation of Coal: by Railroad, Truck and Water: C. V. Beck, president, St. Louis Coal Co., St. Louis.

Sampling Coal Shipments: D. R. Mitchell, assistant professor of mining and metallurgical engineering, University of Illinois.

Types of Solid Fuel: C. M. Smith, reseach assistant professor of mining engineering, University of Illinois.

What's What in Air Conditioning: M. K. Fahnestock, research assistant professor of mechanical engineering, University of Illinois.

New Developments in Stokers: B. M. Guthrie, chief engineer, stoker division, Fairbanks, Morse and Company, Chicago.

Elementary Calculations for Domestic Stoker Installations: Frank J. Hoke, vice president, Holcomb and Hoke Manufacturing Company, Indianapolis.

A Year-'Round Hot Water Supply: R. E. Moore, vice president, Bell and Gossett Company, Chicago.

Preparation and Utilization of Coal for: Domestic Fuel: D. R. Mitchell, assistant professor of mining and metallurgical engineering, University of Illinois.

Small Steam Plants: L. A. Shipman, combustion engineer, Southern Coal and Coke Company, Knoxville, Tenn.

Large Steam Plants: J. G. Worker and C. L. Myers, American Engineering Company, Philadelphia.

Railroads: E. G. Young, research professor of railway mechanical engineering, University of Illinois.

A Real Problem: Cooperation Between Coal Producers, Equipment Manufacturers, Railroads, and Consumers: E. G. Bailey, vice president, the Babcock and Wilcox Company, New York.

Coal Sales Beyond the Horizon: Barton R. Gebhart, vice president in charge of sales, Chicago, Wilmington and Franklin Coal Company, Chicago.

Problems of Retail Fuel Marketing: Norvin H. Vaughan, assistant general sales agent, Consolidated Coal Company, Chicago.

"Trouble Shooting" in Large Heating Plants: Osborne Monnett, advisory engineer, Commercial Testing and Engineering Company, Chicago.

Some Things We Have Learned About Selling Stokers: Russell G. Glass, sales manager, stoker division, Pocahontas Fuel Company Incorporated, Cleveland Heights, Ohio.

Advertising Methods and Results as Applicable to Retail Dealers: I. M. Adams, The Hubbell Advertising Agency, Inc., Cleveland.

Selling Heat Service vs. Selling Coal: Paul D. Hess, Heat Service, Inc., Macon, Mo.

Taxation and Business: Merlin H. Hunter, professor of economics, University of Illinois; chairman, Committee on Economy and Efficiency in Government, Kiwanis International.

B.t.u. Determinations: A. C. Callen, head of the department of mining and metallurgical engineering, University of Illinois.

Question Box: Written questions may be deposited in the Question Box up until

The Washington Post.

noon on Thursday. They will be answered by members of the University staff or by specially-selected men from industry. This is a new feature of the Short Course. It should be extremely interesting, and of great value in clearing up any questions that need additional explanation.

● THE OUTPUT of refined primary lead from domestic ore in the United States in 1935 amounted to 310,505 short tons, valued at $24,840,000, compared with 299,841 tons, valued at $22,188,000, in 1934, increases of 4 percent in quantity and of 12 percent in value. The small advance in 1935 marked a continuation of the gradual upward trend that began in 1933. The production of refined lead from foreign sources amounted to 14,055 tons, principally from Mexico, Newfoundland, and Peru, compared with 11,395 tons in 1934. The total output of primary lead from domestic and foreign sources was thus 324,560 tons in 1935, an increase of 4 percent over the output of 311,236 tons in 1934. The principal sources of production in the United States were again Missouri, Utah, and Idaho, whose output represented 78 percent of the total for the country in 1935. The quantity of refined primary lead available for consumption in the United States in 1935 amounted to 309,911 tons, compared with 298,141 in 1934, an increase of 4 percent. Antimonial lead produced at primary smelters in 1935 totaled 16,384 short tons, containing approximately 4,685 tons of primary domestic lead, 491 tons of primary foreign lead, 1,110 tons of primary domestic antimony, 26 tons of primary foreign antimony, 9,479 tons of secondary lead, and 593 tons of secondary antimony.

● ANTHRACITE IMPORTS during March totaled 43,989 net tons, as compared with 61,611 tons imported during March, 1935. Of this total, 21,020 tons were of Russian origin, while the remaining 22,857 tons were from Great Britain and Canada.

During the Coal Year 1935-1936, a total of 612,181 tons were imported, receipts from Russia aggregating 407,750 tons, or 67 percent of the total. Importations from this source are continuing the steady increase witnessed during the past several years; this year's figure is 15 percent in excess of that for 1934-1935. Receipts from Great Britain and Canada, amounting to 204,431 tons, show a gain of 29 percent over last year.

	By Ports of Entry March 1936	March 1935	Coal Year 1935-1936	1934-1935
Maine & New Hampshire	3,248	3,519	42,398	32,473
Massachusetts	25,061	41,437	412,702	374,043
Rhode Island	10,182	12,330	101,307	86,489
Connecticut	....	3,472	20,830	17,450
New York	5,498	....	5,782	821
Washington	....	853	2,983	1,059
Dakota	....	....	8	12
Vermont	....	....	46	....
Virgin Islands	....	....	26,125	....
Total	43,989	61,611	612,181	512,347

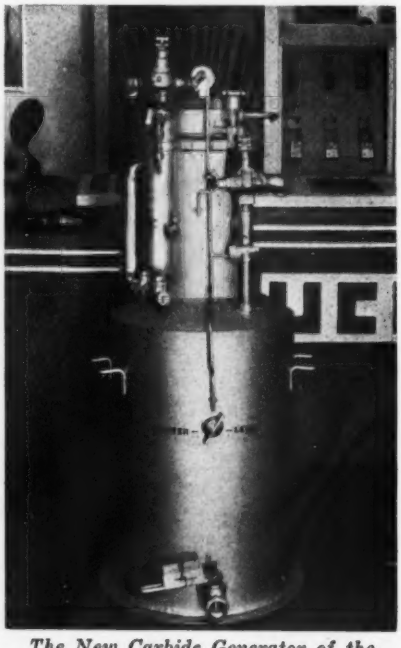
	By Sources March 1936	March 1935	Coal Year 1935-1936	1934-1935
Great Britain	22,857	17,444	199,639	155,021
Canada	112	1,012	4,795	3,485
Russia	21,020	43,155	407,747	353,841
Total	43,989	61,611	612,181	512,347

(Anthracite Institute.)

● THE IDAHO Mining Association held a meeting at Lewiston, April 24 and 25.

Stanly A. Easton, president of Bunker Hill and Sullivan Mining Company and president of the Idaho Association, presided at the convention sessions. At the evening banquet Dr. A. W. Fahrenwald, director of the Idaho Bureau of Mines and Geology, showed pictures taken along the Salmon River—"The River of No Return"—and Walter C. Clark, electrical engineer of Kellogg, showed pictures of many mining scenes in Idaho.

During the convention, addresses and papers were given as follows: Walter Hovey Hill, E.M., Grangeville, "Salmon River Operations"; W. N. Robinson, Dixie, Idaho, "Open Pit Mining"; Arthur Campbell, state mine inspector, "The Mining Outlook"; Rush J. White, E.M., Wallace, "Geology of Central Idaho"; E. T. Fisher, Warren, Idaho, "Dredging"; Patrick L. McManus, University of Idaho, "Economics of Flotation"; S. O. Miller, Golden, Idaho, "Development of the Lone Pine Group"; J. W. Taylor, assistant attorney general of Idaho, "Revenue Act of 1936"; Frank Eichelberger, manager, Sunshine Mining Company, "The Sunshine Mine"; Oscar W. Worthwine, attorney, "Mining Rights in Stream Beds"; Tasker L. Oddie, Reno, Nev., former U. S. Senator, "RFC Mine Loans."



The New Carbide Generator of the Union Carbide Company shown at recent Coal Exposition

—— *Personals* ——

A. W. Dodd has been elected vice president of the American Zinc, Lead & Smelting Co., with **W. N. Payne**, secretary and treasurer. **Wm. G. Irwin** has been elected chairman of the executive committee of the company.

E. F. Entwisle has been appointed assistant general manager of the Lackawanna Plant of the Bethlehem Steel Corporation.

Howard I. Young, president, American Zinc, Lead & Smelting Co., and president, American Mining Congress, was host at a special luncheon to the Board of Directors of the Congress and important industrial leaders during the Cincinnati convention, May 11-15.

A. E. Bendelari, president, Eagle-Picher Lead Company, served as official host for the city of Cincinnati during the recent coal convention and exposition held in that city under auspices of The American Mining Congress.

Robert S. Palmer, secretary of the Colorado Metal Mining Fund, and **Mrs. Palmer** have returned to Denver after an eastern trip which included a stop at Cincinnati, Ohio, where Mr. Palmer inspected the coal convention and exposition of The American Mining Congress, and extended a cordial invitation to exhibitors to participate in the Congress' Metal Mining Convention and Exposition scheduled for Denver late in September.

J. P. Williams, Jr., president of the Koppers Coal Company; **J. D. A. Morrow**, president, Pittsburgh Coal Company, and **J. D. Francis**, president, Island Creek Coal Company, were among those who participated in the annual dinner at the recent coal convention at Cincinnati. Among the members of the national board of directors and officers of major committees of The American Mining Congress who attended the Cincinnati coal convention were: **R. C. Allen**, Oglebay,

Norton & Company; **J. B. Putnam**, Andrews, Haddens & Putnam; **Erle V. Daveler**, Utah Copper Company; **D. D. Moffat**, Utah Copper Company; **A. E. Bendelari**, Eagle-Picher Lead Company; **Andrew Fletcher**, St. Joseph Lead Company; **D. A. Callahan**, Callahan Zinc-Lead Company.

Arthur Notman has returned to New York after spending several weeks in Nevada on professional business.

John C. Cosgrove, president of the W. Va. Coal and Coke Corporation, recently returned to this country after an extended trip through South America.

Neil G. Salsich, vice president of the Jeffrey Manufacturing Company, recently visited the Duluth iron district where his brother, **Leroy Salsich**, who is president of the Oliver Iron Mining Company, resides.

C. M. Watt has been elected president and general manager of the Loyal Hanna Coal & Coke Company.

C. E. Bockus, president, The Clinchfield Coal Corporation, was chairman at a round-table conference on natural resource policies during the annual meeting of the U. S. Chamber of Commerce.

Arthur Roeder was elected president of the recently reorganized Colorado Fuel and Iron Corporation. **W. A. Maxwell, Jr.**, was elected vice president, **S. G. Pierson**, vice president and treasurer; **Newell Orr** and **Thomas Aurelius**, vice presidents; **D. C. McGrew**, secretary.

George S. Rice, Chief Mining Engineer of the U. S. Bureau of Mines, received an honorary degree of Doctor of Science from Lafayette College.

Charles H. Segerstrom, president of the Nevada-Massachusetts Company, has taken a lease upon and will operate a group of gold-quartz mines in Amador County, California.

Lucien Eaton recently returned from an exploration trip to Nicaragua.

Callers at the Washington headquarters of The American Mining Congress during the month of May were **H. B. Fernald**, Loomis, Suffern & Fernald; **W. H. Peter**, Hanna Coal Company; **Milton Simpson**, Root, Clark, Buckner, and Ballantine; **E. L. Kirkwood**, Cleveland-Cliffs Iron Company, **J. W. Allen**, Inspiration Consolidated Copper Company; **Robt. E. Dwyer**, Anaconda Copper Mining Company; **H. C. Jackson**, Pickands, Mather & Company; **R. K. Shirley**, Freeport Sulphur Company; **A. G. Mackenzie**, Utah Chapter, American Mining Congress; **W. Mont Ferry**, Silver King Coalition Mines; **F. G. Hamrick**, American Smelting and Refining Co., and **R. D. Campbell**, Island Creek Coal Company.

George C. Branner was recently elected president of the American State Geologists.

Joseph Pursglove, Jr., has joined in the firm of United Engineers and Constructors who are the licensors for the Chance Coal Cleaning Process.

Carl Zapffe recently made an address before the Duluth Engineering Club on "Development of Iron Mining in the Lake Superior District."

Stanley A. Knisley has been made director of advertising with supervision over all advertising for the Republic Steel Corporation. **Chester W. Ruth** has been made assistant advertising director.

Wm. Koerner, general manager of the Magma Copper Company, has been elected a director of that company.

The 45th general meeting of the Iron and Steel Institute was held on May 28 at the Waldorf Astoria Hotel in New York City. Among the speakers were **Eugene C. Grace**, Bethlehem Steel Corp.; **W. A. Irwin**, U. S. Steel Corporation; and **T. M. Girdler**, Republic Steel Corporation; **E. T. Weir**, delivered an address on a sound commercial policy for steel makers. The Gerry Medal was awarded **John V. Tytus**, vice president of the American Rolling Mill Company. The medal was presented by **Eugene C. Grace**.

F. W. Maclennan, general manager of the Miami Copper Company, will retire from the active management of this company the first of June. He will continue his relations with the company in a consulting capacity.

A. S. Winther has been elected general manager of the Miami Copper Company.

In the exhibit of the Hercules Powder Company at the recent Coal Exposition were displayed new developments in the field of blasting. It featured the new Hercotube electric blasting cap

Progress in Related Fields of Industry

(*Continued from page* 16)

solve many problems. If the skill and talents of these men can be enlisted their cooperation will be assured, and we will be able to secure more data that will be on a practical operating basis."

One of the world-famous British mining machinery companies has operated a Suggestion Department for many years. From all I can learn this program has been highly successful. It has resulted in a fine feeling among the employes because they have been rewarded for their suggestions, and they realize that expansion of the company's business means a better opportunity for them; for the company it has been worth while, because it has produced a more cordial relationship in the plant, and it has given the company the best that each and every employe could give. A number of industries in this country are striving to use the talents of the rank and file through Suggestion Departments and similar plans which offer incentives for improvements in methods, equipment, and products, and I am sure that your careful consideration will prove the importance of improving any plan you may now have to secure the cooperation of your staff and working force so that you may use effectively all the skill and brain power of loyal employes.

In closing, may I leave with you the suggestion that while we are building bigger and better plants and mines and improving our operating methods on the technical side, we do not overlook the human side; we must give more thought to the training of face bosses, mechanics, and the men at the face. Most of these men are eager to help, to have a part in our program, and to have some recognition for their increased efforts. With their fullest cooperation even greater progress is possible.

PETER F. LOFTUS

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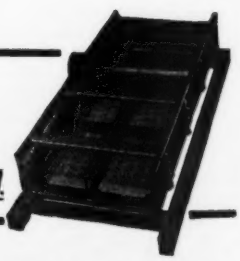

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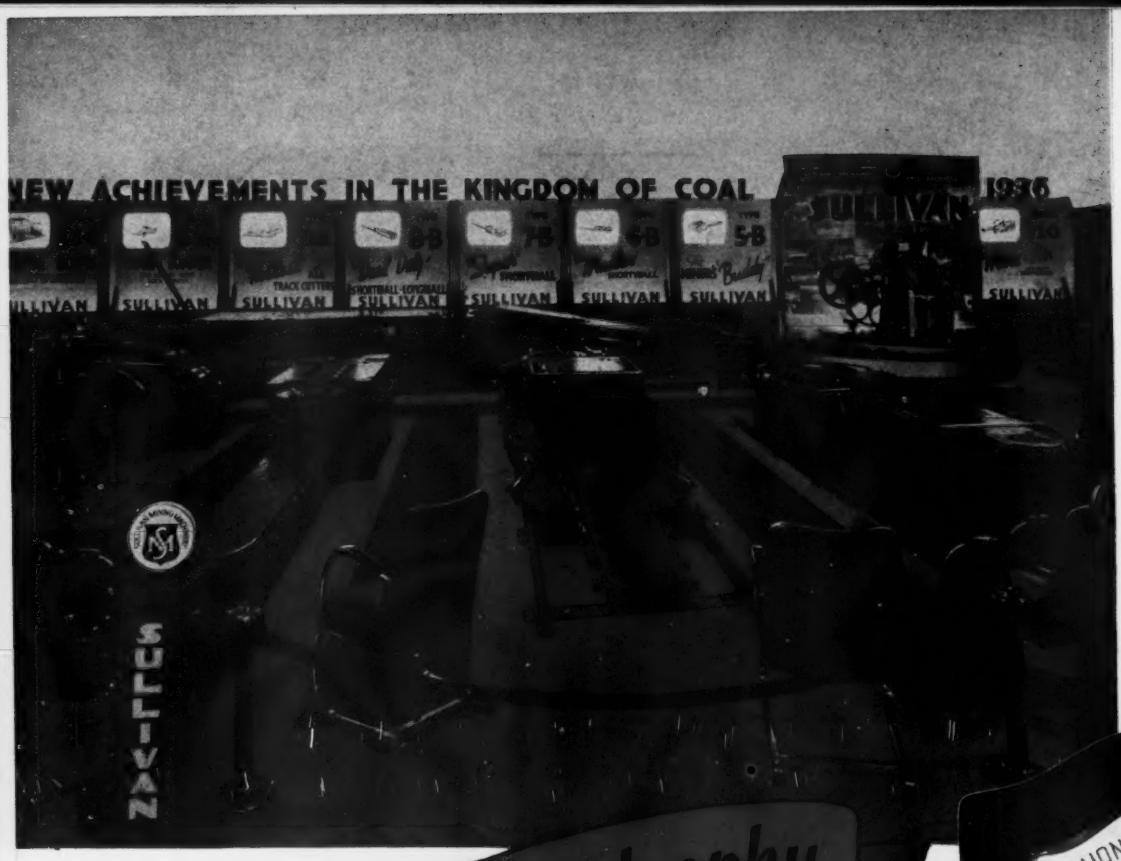

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- Room Hoists
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